

**Description of the courses in the Language and  
Prep Program  
University of applied sciences profile Nature,  
Technology and Health**

**Incl. Annex – Language and Prep Program exit qualifications  
for transferring to the university of applied sciences profile  
Nature, Technology and Health**

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## 1. Introduction

The Language and Prep Program (LPP) offers all the courses that meet the statutory exit qualifications for the education pathway for the university of applied sciences profile Nature, Technology and Health. The exit qualifications for the profile are presented in the annex at the end of this document.

If you switch to Radboud University during the second year, your participation will then fall under the EER of the Radboud University LPP, where different exit qualifications apply. The main text of the EER describes how the LPP is set up. This appendix provides descriptions of all the courses that are taught under the LPP, including how many contact hours each course involves and how it is assessed. The description of each course also includes a reference to the exit qualifications that the participant works towards.

The LPP consists of basic courses and specific courses.

Basic courses are courses that all participants must take. They are:

- Dutch as a Second Language (NT2), from A0 to B1
- Dutch as a Second Language (NT2), from B1 to B2
- Knowledge of Dutch Society
- English B1, in preparation for a Dutch-taught program, or English B2, in preparation for an English-taught program
- Study skills
- Education and Career Orientation
- Mathematics A, in preparation for a degree program in the domain of social studies or economics, or Mathematics B, in preparation for a science-based program such as ICT, Mechanical Engineering, Civil Engineering or Life Sciences.

Specific courses are selected according to your chosen degree program. The specific courses are:

- Biology
- Physics
- Chemistry

Each course is described below.

## 2. Basic courses

### 2.1 Dutch as a Second Language, from A0 to B1

<b>Number of contact hours<sup>1</sup>:</b>	<b>480 hours</b>
<b>Study load:</b>	<b>880 hours (incl. contact hours)</b>
<b>Period in the LPP:</b>	<b>Phase 1 (first year)</b>
<b>Required attendance:</b>	<b>80% or more</b>

#### **Objective**

The purpose of this component is for the participant to learn to speak Dutch at B1 level. The participant needs to pass this component as a condition for transferring to Phase 2 of the LPP.

#### **Contents**

During this component, the participant works on mastering the Dutch language at level B1 according to the Common European Framework of Reference for Languages, or CEFR (see <https://www.coe.int/en/web/common-european-framework-reference-languages>). Classes cover the four skills of speaking, reading, listening and writing, as well as grammar, vocabulary and pronunciation. The course consists of two blocks:

- Block 1: from A0 to A2, 240 contact hours over 20 weeks of classes
- Block 2: from A2 to B1, 240 contact hours over 20 weeks of classes

#### **Required prior knowledge**

None: starting level is Dutch (NT2) at level A0.

#### **Exit qualifications**

Mastering the skills of reading, having conversations, speaking, listening and writing in Dutch at CEFR level B1.

#### **Learning method**

Classes, group assignments, test days and excursions. Self-study is important for this course: every week the participant should spend around 10 hours working on assignments and preparing for classes.

#### **Reading material**

Cornax, A., De Groot, F., Mennen, S., Van Sluijs, A. (2020). *Contact! – nieuw 1, 2 and 3* (1<sup>st</sup> edition).

#### **Assessment**

- Test at A2 level for the components of reading, writing, speaking and listening, with one resit allowed per component.
- Test at B1 level for the components of reading, writing, speaking and listening, with one resit allowed per component.

To pass this course, the participant must achieve a pass grade for both these tests.

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<sup>1</sup> Contact hours mean the amount of time spent in class, on projects, in mentoring sessions and on group assignments.

## 2.2 Dutch as a Second Language, from B1 to B2

<b>Number of contact hours:</b>	<b>300 hours</b>
<b>Study load:</b>	<b>600 hours (incl. contact hours)</b>
<b>Period in the LPP:</b>	<b>Phase 2 (second year)</b>
<b>Required attendance:</b>	<b>80% or more</b>

### Objective

The purpose of this course is for the participant to pass the State Exam for Dutch as a Second Language (NT2), Program II. The participant will master Dutch at CEFR level B2 or better. This is the required admission level for studying or working at university of applied sciences or research university level.

### Contents

During this component, the participant works on improving their command of the Dutch language in each of the four skills of reading, writing, listening and speaking, as well as grammar, vocabulary and pronunciation. The classes also focus on study skills. For example, a speaking exercise will be combined with debating skills, a listening exercise will be combined with listening while instructions are being explained, the participant needs to be able to read and understand arguments, and during the writing exercises the participant will practice writing notes.

The course also includes an exam training block where the participant prepares for taking the State Exam for Dutch as a Second Language (NT2), Program II.

### Required prior knowledge

Dutch (NT2) at level B1 for each of the four components (reading, writing, speaking, listening). The participant needs to have passed the course Dutch as a Second Language (NT2) from A0 to B1 to take this course.

### Exit qualifications

Mastering the skills of reading, having conversations, speaking, listening and writing in Dutch at CEFR level B2.

### Learning method

Classes plus project work. Self-study is important for this course: every week the participant should spend around 10 hours working on assignments and preparing for classes.

### Reading material

De Boer, B., Ohlsen, R. (2015). *Nederlands op niveau* (2<sup>nd</sup> edition). Uitgeverij Coutinho.

### Assessment and exams

State Exam for Dutch as a Second Language (NT2), Program II The State Exam for Dutch as a Second Language (NT2) is not administered by the educational institution, but by DUO. The participant is responsible for signing up, via DUO's website. The sign-up is done during an NT2 class, and subject to prior discussion with, and permission from, the NT2 teacher. The teacher will assist the participant with the sign-up process. The State Exam is made up of four separate exams: Reading, Listening, Writing and Speaking. Each of these separate exams lasts 1 or 2 hours. If you fail one exam, you only have to resit that one exam. You may attempt each separate exam a maximum of 3 times per calendar year. You will be awarded your State Exam for Dutch as a Second Language (NT2) II certificate only after you have

passed all four of the exams. You need that certificate to study at university of applied sciences or research university level.

## 2.3 Knowledge of Dutch Society

<b>Number of contact hours:</b>	<b>6 hours</b>
<b>Study load:</b>	<b>12 hours (incl. contact hours)</b>
<b>Period in the LPP:</b>	<b>Phase 1 (first year)</b>
<b>Required attendance:</b>	<b>80% or more</b>

### **Objective**

The purpose of this course is for the participant to learn enough to prepare for the mandatory part of the civic integration exam Knowledge of Dutch Society.

### **Contents**

The participant will learn about some important aspects of Dutch society.

The classes will cover the following themes:

- work and income,
- interactions, values and norms,
- living,
- health and health care,
- history and geography,
- politics and law,
- education and upbringing.

The participant will study information from a range of different sources. The course also includes Knowledge of Dutch Society practice exams.

The participant is expected to spend plenty of time in self-study and to practice the Knowledge of Dutch Society practice exams by themselves.

### **Required prior knowledge**

Dutch (NT2) at A2 level

### **Exit qualifications**

For a detailed description of the exit qualifications, see the Dutch Civic Integration Regulations 2021 (*Regeling Inburgering 2021*), Annex 2 'Exit qualifications for knowledge of Dutch Society within the meaning of article 3.2': <https://wetten.overheid.nl/BWBR0045574/2022-01-01#Bijlage2> (in Dutch)

### **Learning method**

Classes, practice tests. Self-study is important for this training. Visit the DUO website for sample exams for practicing.

### **Reading material**

Bakker, A. (2014). *Kom verder! Examenboek Kennis van de Nederlandse Maatschappij*. Published by: Boom uitgevers Amsterdam

### **Assessment and exams**

Civic Integration State Exam for Knowledge of Dutch Society. The Knowledge of Dutch Society exam is not administered by the educational institution, but by DUO. The participant is responsible for signing up, via DUO's website, in consultation with their teacher. The exam takes 45 minutes, and consists of 45

questions. You need to answer 26 of those questions correctly. You may attempt the exam a maximum of 3 times per calendar year.



## 2.4 English at CEFR level B1

<b>Number of contact hours:</b>	<b>48 hours</b>
<b>Study load:</b>	<b>96 hours (incl. contact hours)</b>
<b>Period in the LPP:</b>	<b>Period 1, Phase 2</b>
<b>Required attendance:</b>	<b>80% or more</b>

### **Objective**

The purpose of this component is for the participant to pass the final test for English at B1 level, for the skills of reading and listening. The goal is to master English at B1 level, which is a requirement for a Dutch-language study program and/or work setting at university of applied sciences level.

### **Contents**

During this component, the participant will achieve English at level B1 according to the Common European Framework of Reference for Languages. It covers the four skills of speaking, reading, listening and writing, although it emphasizes reading and listening. Grammar, vocabulary and pronunciation are also covered.

### **Required prior knowledge**

English at A2 level

### **Exit qualifications**

English reading and listening skills at CEFR level B1.

### **Learning method**

Classes, with frequent group assignments, interactive exercises and discussion of homework assignments. Every week the participant should spend around 3 hours working on assignments and preparing for classes.

### **Reading material**

Capel, A., Nixon, R. (2009) *PET Masterclass Intermediate Student's Book*. Published by Oxford University Press.

### **Assessment**

- Final test of English listening and reading at B1 level, with one resit allowed.

## 2.5 English at CEFR level B2

<b>Number of contact hours:</b>	<b>28 hours</b>
<b>Study load:</b>	<b>70 hours (incl. contact hours)</b>
<b>Period in the LPP:</b>	<b>Period 1, Phase 2</b>
<b>Required attendance:</b>	<b>80% or more</b>

### **Objective**

This purpose of this component is for the participant to achieve Cambridge Assessment English at B2 level (reading, listening, speaking and writing). The goal is to master English at B2 level, which is a requirement for an English-language study and/or work setting at university of applied sciences level.

### **Contents**

During this component, the participant will achieve English at level B2 according to the Common European Framework of Reference for Languages. Classes cover the four skills of speaking, reading, listening and writing, as well as grammar, vocabulary and pronunciation.

### **Required prior knowledge**

English at B1 level, as demonstrated through an Oxford Placement Test, which the participant needs to take before moving to Phase 2 of the LPP.

### **Exit qualifications**

Mastering the skills of reading, having conversations, speaking, listening and writing in English at CEFR level B2.

### **Learning method**

Classes, with frequent group assignments, interactive exercises and discussion of homework assignments. Every week the participant should spend around 3 hours working on assignments and preparing for classes.

### **Reading material**

Haines, S. *Cambridge English First Certificate Masterclass* (revised edition, 2015). Published by Oxford University Press.

### **Assessment**

– Cambridge B2 test, with one resit allowed.

## 2.6 Study skills

<b>Number of contact hours:</b>	<b>12.5 hours</b>
<b>Study load:</b>	<b>40 hours (incl. contact hours)</b>
<b>Period in the LPP:</b>	<b>Periods 1 to 4, Phase 2 (year 2)</b>
<b>Required attendance:</b>	<b>80% or more</b>

### **Objective**

The purpose of this course is to prepare the participant as best as possible for successfully transferring to a study and work setting at university of applied sciences level, with the required study skills.

### **Contents**

During the classes on learning skills, but also during other classes such as Dutch as a Second Language (NT2), the participant will be taught to develop the following skills:

1. Social, cultural and intercultural skills: e.g. how teachers and participants interact, how to deal with diversity and inclusion, reflect and feedback.
2. Independent learning capabilities and project-based teamwork: e.g. researching and analyzing information, studying and planning independently.
3. Study-related language skills: e.g. reading instructions and arguments, debating and taking part in discussions, writing notes.
4. Digital skills: e.g. being able to use the hardware and software that are needed for studying, using online information and becoming media-savvy.

Using assignments and projects, the participant has to demonstrate to the class that they are developing these skills. Progress reports are used to monitor that improvement, which are filled out by the teacher, with help and input from the rest of the teaching team. A progress report describes the participant's starting situation for each of the required exit qualifications, followed by their progress at the end of Period 1 and during Period 4.

The teacher will talk to every participant about what improvement they have made in each of the exit qualifications. This is done using a work form to record what kind of evidence (assignments, projects, presentations, etc.) was used and what the result is. The work form is filled out by the participant and the teacher together.

At the end of period, the teacher determines what the participant's status is, and then records that result in the progress report. The teacher discusses the feedback with the participant, and if relevant links the feedback from the progress report to the feedback in the work form. The standard forms for the progress report and the work form are included in annexes 2 and 3 to this document.

### **Required prior knowledge**

Dutch (NT2) at level B1

### **Exit qualifications**

For a detailed description of the exit qualifications, see Appendix 1 to the EER, in paragraph 1 of the Exit qualifications for Study Skills.

### **Learning method**

Besides the classes for the Study Skills course, participants also work on group projects and individual projects. They also develop their study skills by carrying out assignments for other LPP courses, including Dutch as a Second Language (NT2), English and Knowledge of Dutch Society.

### **Assessment**

The teacher monitors the participant's progress using a progress report. That document, which is intended for the teacher, tracks the participant's status in each of the exit qualifications. Next, feedback is presented for each course of the areas where the participant needs to improve during the next period. The progress report also serves as a formal basis for establishing and justifying the pass/fail decision. The teacher decides whether the participant meets the exit qualifications. The progress report for Period 1 (Phase 2) also includes input from the coach for Radboud University's LPP.

When using the progress report to assess the participant, the teacher will abide by the following principles:

- The participant needs to show improvement. They are not tested for a specific level. That improvement might be visible/noticeable rather than quantifiable. The improvement ("working towards") continues both during the LPP and during the participant's further studies.
- The idea is for the participant to show enough improvement, and to have sufficient knowledge and skills, to be prepared for the further studies that they have chosen. The decision about what a "pass" means in the context of the further studies is for the educational institution to make.
- The participant's improvement in the various exit qualifications is influenced (at least in part) by motivation, language skills, personal qualities and/or individual circumstances. This means that the participant might show little or no improvement in specific components. A holistic approach to the exit qualifications, rather than treating them as a checklist, means that the participant might meet the exit qualifications even if they do not demonstrate the same level of improvement in every component.

## 2.7 Education and Career Orientation

<b>Number of contact hours:</b>	<b>22 hours</b>
<b>Study load:</b>	<b>40 hours (incl. contact hours)</b>
<b>Period in the LPP:</b>	<b>Period 2 of Phase 1 and Period 1 of Phase 2</b>
<b>Required attendance:</b>	<b>80% or more</b>

### **Objective**

The purpose of this course is for the participant to make an appropriate and realistic choice for their further studies and, by extension, their career path. During this course, the participant will learn more about their own capabilities and their own wants and dreams. They will find out about various specializations and professions, and will prepare as best as possible for choosing their further studies and by extension a career path. By the end, the participant can make a realistic and deliberate choice about what to study.

Lastly, the participant will be guided through the application process, from signing up in Studielink to enrolling for a program. They will also learn how to apply for student finance.

### **Contents**

In Period 4 of Phase 1, the participant works on developing all the skills described above, during classes and in individual and group assignments. In Period 1 of Phase 2, the participant is coached in deciding on a degree program at a university of applied sciences or research university. Each participant is helped to determine what specific courses they need to take for their preferred program. If the participant chooses to study at a research university, at the end of Period 1 they will transfer to the Radboud University LPP.

The deadline for the participant to enroll in a program is 1 May. During their meetings with the coach in Periods 1 and 2, participants will discuss what they need to do to be admitted to their chosen degree program.

Using the assignments, the participant has to demonstrate that they are gaining insight into education and career paths. Progress reports are used to monitor that improvement, which are filled out by the teacher.

The teacher will talk to every participant about what improvement they have made in each of the exit qualifications. This is done using a work form to record what kind of evidence (assignments, projects, presentations, etc.) was used and what the result is. The work form is filled out by the participant and the teacher together.

At the end of the period, the teacher determines what the participant's status is, and then records that result in the progress report. The teacher discusses the feedback with the participant, and if relevant links the feedback from the progress report to the feedback in the work form. The standard forms for the progress report and the work form are included in annexes 4 and 5 to this document.

### **Required prior knowledge**

Dutch (NT2) at A2 level

### **Exit qualifications**

The participant should have developed the following skills:

- a) The participant can describe their own capabilities (qualities, learning capability, the necessary language skills and expertise).
- b) The participant can describe their own wants and dreams in relation to their career path and/or education.
- c) The participant can either describe possible career paths that suit their preferred education, or else describe appropriate educational options to reach their preferred career path.
- d) The participant can make a realistic choice for a degree program that suits their capabilities and circumstances.
- e) The participant has an accurate and up-to-date understanding of the labor market prospects in relation to their preferred career path/educational options and can describe those prospects.
- f) The participant has a realistic understanding of their chosen program and the associated professional field.
- g) The participant understands the importance of having their own network in the Netherlands, knows how to build their own network and can describe this.

### **Learning method**

Classes, individual and group assignments and excursions (e.g. Open Days, student-for-a-day sessions and visits to companies).

### **Assessment**

The teacher monitors the participant's progress using a progress report. The progress report tracks the participant's current status with the various exit qualifications and shows where the participant needs to improve during the next period. The progress report also serves as a formal basis for establishing and justifying the pass/fail assessment. The teacher decides whether the participant meets the exit qualifications.

When using the progress report to assess the participant, the teacher will abide by the following principles:

- The participant needs to show improvement. They are not tested for a specific level. That improvement might be visible/noticeable rather than quantifiable. The improvement ("working towards") continues both during the LPP and during the participant's further studies.
- The idea is for the participant to demonstrate enough improvement, and have sufficient knowledge and skills, to make an appropriate and realistic choice of education and career path.

## 2.8 Mathematics A

**Contact hours:** 60 hours (20 sessions of 3 hours)

**Study load:** 120 hours

**Period in the LPP:** Periods 1 to 3, Phase 2

**Required attendance:** 80% or more

### Objective

The purpose of this component is for the participant to achieve HAVO<sup>2</sup> level in Mathematics A, which is necessary for study or work at university of applied sciences or research university level. The course prepares the participant for further university of applied sciences programs in the domain of social studies or economics, for example Educational Theory, Public Administration, Economics, Law, Management, Logistics, Marketing and other programs that require an understanding of statistics. This course is also accepted for medical sciences, for example Physiotherapy, Health Care and Applied Biology.

### Contents

The participant will learn a range of mathematical skills and applications. The 2 blocks of classes making up the component are described below. This component uses the books Getal & Ruimte Wiskunde A HAVO, volumes 1 to 3.

#### **Block 1 Basic mathematical skills, functions and graphs**

- This block uses the following chapters in *Getal & Ruimte Wiskunde A HAVO*:
  - Volume 1 Chapter 1 Rekenregels en verhoudingen (1.1 to 1.4)
  - Volume 1 Chapter 3 Tabellen en grafieken (3.2 to 3.4)
  - Volume 2 Chapter 5 Lineaire verbanden (5.1 to 5.4)
  - Volume 2 Chapter 7 Veranderingen (7.1 to 7.3)
  - Volume 3 Chapter 11 Formules en variabelen (11.1 to 11.5)
- Topics: Mathematical rules, exponentiation, roots, substitution, linear and quadratic equations, linear and quadratic formulas, linear inequalities, systems of linear equations, formulas and variables and changes.
- The block ends with a quick refresher, and exercises at the exam level are used to prepare for the test.
- Exit qualifications: A3, B1, B2, C1, C3, C4, D.
- Number of classes: 10.
- The block ends with Test T1, which covers the material from Block 1.

#### **Block 2 Counting and Statistics**

- This block uses the following chapters in *Getal & Ruimte Wiskunde A HAVO*:
  - Volume 1 Chapter 2 Verwerken van data (2.1 to 2.4)
  - Volume 1 Chapter 4 Handig tellen (4.1 to 4.4)
  - Volume 2 Chapter 6 Statistiek en beslissingen (6.1 to 6.4)
  - Volume 3 Chapter 9 Exponentiële verbanden (9.1 to 9.5)
  - Volume 3 Chapter 10 Statistische verbanden (10.1 to 10.4)

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<sup>2</sup> HAVO5 = senior general secondary education level 5

- Topics: Counting and statistics, percentages, exponential functions, smart ways of counting, combinatorics, normal distribution.
- The block ends with a quick refresher, and exercises at the exam level are used to prepare for the test.
- Exit qualifications: A3, B3, C5, E1, E2.
- Number of classes: 10.
- The block ends with Test T2, which covers the material from Block 2.

### **Required prior knowledge**

Basic mathematical understanding, HAVO3 level

### **Exit qualifications**

For a detailed description of the exit qualifications, see Appendix 1 to the EER, in paragraph 5 of the Exit qualifications for Mathematics A HAVO.

### **Learning method**

Classes, either online or on location (3 hours x 20 sessions including tests, not including resits). The participant will also need to spend time on homework and self-study.

### **Reading material**

*Getal & Ruimte Wiskunde A HAVO*, volumes 1 to 3.

### **Assessment and exams**

Each block ends with a quick refresher of the material and a test. Each test lasts 100 minutes and counts towards 50% of the final grade. The participant has one opportunity to resit the tests at the end of the component. The tests are always taken on location.



## 2.9 Mathematics B

**Contact hours:** 72 hours (24 sessions of 3 hours)

**Study load:** 144 hours

**Period in the LPP:** Periods 1 to 3, Phase 2

**Required attendance:** 80% or more

### Objective

The purpose of this component is for the participant to achieve HAVO<sup>3</sup> level in Mathematics B, which is necessary for a study or work setting at a higher level. The course prepares the participant for further study in a science-based university of applied sciences program such as ICT, Mechanical Engineering, Civil Engineering or Life Sciences.

### Contents

The course content mostly deals with analysis and geometry, while also spending significant time on algebra skills, formula skills, reasoning, algebraization, ordering and structuring, analytical thinking and problem-solving, manipulating formulas, abstracting and using logic for reasoning and proof.

#### Block 1

- Block 1 uses the following chapters from *Getal & Ruimte Wiskunde B HAVO*, volumes 1 and 2:
  - Chapter 1 Formules, grafieken en vergelijkingen (1.1 to 1.4)
  - Chapter 2 Veranderingen (2.1 to 2.5)
  - Chapter 3 Hoeken en afstanden (3.1 to 3.4)
  - Chapter 4 Werken met formules (4.1 to 4.4)
  - Chapter 5 Machten, exponenten en logaritmen (5.1 to 5.4)
- Topics: linear functions, quadratic functions, system equations, changes, diagrams, tangent lines, slope graphs, differentiation, trigonometric functions and similarity, higher degree equations, inequalities, fractional formulas, powers and roots, exponential functions and logarithms.
- The block ends with a quick refresher, and exercises at the exam level are used to prepare for the test.
- Exit qualifications: A3, B1, B2, C1, D1.
- Number of classes: 12.

#### Block 2

- Block 2 uses the following chapters from *Getal & Ruimte Wiskunde B HAVO*, volumes 2 and 3:
  - Chapter 6 De afgeleide functie (6.1 to 6.3)
  - Chapter 8 Goniometrie (8.1 to 8.5)
  - *Getal & Ruimte Wiskunde B HAVO*, volume 3
  - Chapter 9 Exponentiële verbanden (9.1 to 9.3)
  - Chapter 11 Verbanden en functies (11.2 and 11.3)
- Topics: Derived functions, tangent lines and apexes, unit circles, radians, transformations, sinusoidal applications and formulas, trigonometric equations, exponential formulas and logarithms, direct and inverse proportions and standard functions.

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<sup>3</sup> HAVO5 = senior general secondary education level 5

- The block ends with a quick refresher, and exercises at the exam level are used to prepare for the test.
- Exit qualifications: A3, B1, B2, B3, B4, D1, D2, D4.
- Number of classes: 12.

**Required prior knowledge**

Basic mathematical understanding, HAVO3 level

**Exit qualifications**

For a detailed description of the exit qualifications, see Appendix 1 to the EER, in paragraph 5 of the Exit qualifications for Mathematics B HAVO.

**Learning method**

Classes on location (3 hours x 24 sessions including tests, not including resits). The participant will also need to spend time on homework and self-study.

**Reading material**

*Getal & Ruimte Wiskunde HAVO B*, 11<sup>th</sup> edition, volumes 1 to 3.

**Assessment and exams**

Each block ends with a quick refresher of the material and a test. The tests at the end of each block last 100 minutes. Each counts towards 50% of the final grade. The participant has one opportunity to resit the tests at the end of the component.

## 3 Specific courses

### 3.1 Biology

**Contact hours:** 60 hours (20 sessions of 3 hours)

**Study load:** 120 hours

**Period in the LPP:** Periods 2 to 4, Phase 2

**Required attendance:** 80% or more

#### Objective

The purpose of this component is for the participant to achieve HAVO5<sup>4</sup> level in Biology, which is necessary for a study or work setting at a higher level. The emphasis is on the human body, with significant focus on the terminology.

#### Contents

The Biology component consists of 20 classes divided across 2 blocks:

##### **Block 1**

- Topics: cells and heredity (cells, DNA, genetics, reproduction, defense systems, enzymes and energy).
- The block ends with Test T2.
- Exit qualifications: A11,14,15, B1, B3, B4, B5, C2, E1, E2, E3, E4.
- Number of classes: 10.

##### **Block 2**

- Topics: the human body (metabolism, nutrition, elimination, transport, gas exchange, observation, movement, regulation).
- The block ends with Test T1.
- Exit qualifications: A11, 14, 15, B2, B3, B4, B6, B7.
- Number of classes: 10.

#### Required prior knowledge

Basic knowledge of Biology, at HAVO3 level

#### Exit qualifications

For a detailed description of the exit qualifications, see Appendix 1 to the EER, in paragraph 5 of the Exit qualifications for Biology HAVO.

#### Learning method

Classes, either online or on location (3 hours x 20 sessions including tests, not including resits). The participant will also need to spend time on homework and self-study.

#### Reading material

The participant will use the following books from *Biologie voor jou* (Malmberg, 5<sup>th</sup> edition):

- Leeropdrachtenboek HAVO, volume 4a (ISBN: 9789034574244)

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<sup>4</sup> HAVO5 = senior general secondary education level 5

- Leeropdrachtenboek HAVO, volume 4b (ISBN: 9789034574251)
- Leeropdrachtenboek HAVO, volume 5a (ISBN: 9789034574268)
- Leeropdrachtenboek HAVO, volume 5b (ISBN: 9789034574275)

The participant will also use BiNaS (Noordhoff, 6<sup>th</sup> edition, ISBN: 9789001817497).

### **Assessment and exams**

Each block ends with a quick refresher of the material and a test. Each test lasts 100 minutes and counts towards 50% of the final grade. The participant has one opportunity to resit the tests at the end of the component. The tests are always taken on location.

## 3.2 Physics

**Contact hours:** 66 hours (22 sessions of 3 hours)

**Study load:** 132 hours

**Period in the LPP:** Periods 2 to 4, Phase 2 (year 2)

**Required attendance:** 80% or more

### Objective

The purpose of this component is for the participant to achieve HAVO5<sup>5</sup> level in Physics, which is necessary for a study or work setting at a higher level. The course prepares the participant for further study in a science-based university of applied sciences program such as natural sciences, engineering sciences and medical sciences.

### Contents

The emphasis is on learning to properly apply various physics-related arithmetical and mathematical skills to specific problems. The component covers the terminology and interpreting and producing terminology, including the phrases for formulas, conventions and notations, quantifying physical quantities and relating mathematical phrases to physical concepts. It consists of 2 blocks of classes:

- Block 1: using the coursebooks *Newton Basisboek HAVO4* and *Newton Basisboek HAVO5*.
  - o Volume 4 HAVO, chapters 2, 4, 5 and 6
  - o Volume 5 HAVO, chapter 7
  - o Elective: Optics.

Topics: General skills, motion, forces, radiation and perception, waves and oscillation, optics.

Exit qualifications: A, B1, B2, B3, C1

Number of classes: 11.

- Block 2: using the coursebooks *Newton Basisboek HAVO4* and *Newton Basisboek HAVO5*.
  - o Volume 4 HAVO, chapters 1 and 3
  - o Volume 5 HAVO, chapters 8 and 9
  - o Elective: Automation Engineering.
  - o Topics: Electrical circuits and energy consumption, materials and particle models, energy and power, astronomy.
  - o Exit qualifications: A, C2, D1, E1, G1, G2.
  - o Number of classes: 11.

### Required prior knowledge

Basic understanding of physics, HAVO3 level

### Exit qualifications

For a detailed description of the exit qualifications, see Appendix 1 to the EER, in paragraph 5 of the Exit qualifications for Physics HAVO.

### Learning method

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<sup>5</sup> HAVO5 = senior general secondary education level 5

Classes, either online or on location (3 hours x 26 sessions including tests, not including resits). The participant will also need to spend time on homework and self-study.

**Reading material**

Newton Basisboek HAVO4 and Newton Basisboek HAVO5  
BiNaS (Noordhoff, 6<sup>th</sup> edition, ISBN: 9789001817497)

**Assessment and exams**

Each block ends with a quick refresher of the material and a test. Each test lasts 100 minutes and counts towards 50% of the final grade. The participant has one opportunity to resit the tests at the end of the component. The tests are always taken on location.

### 3.3 Chemistry

**Contact hours:** 66 hours (22 sessions of 3 hours)

**Study load:** 165 hours

**Period in the LPP:** Periods 2 to 4, Phase 2 (year 2)

**Required attendance:** 80% or more

#### Objective

The purpose of this component is for the participant to achieve HAVO5<sup>6</sup> level in Chemistry, which is necessary for a study or work setting at a higher level. The course prepares the participant for further study in a science-based university of applied sciences program such as natural sciences, engineering sciences and medical sciences.

#### Contents

- Block 1: using the coursebook *Chemie Overal HAVO*, 4<sup>th</sup> edition. The topics relating to the exit qualifications listed below are taught using the following chapters from HAVO volume 4: Chapter 1 Scheiden en reageren  
Chapter 2 Bouwstenen van stoffen  
Chapter 3 Stoffen en reacties  
Chapter 4 Moleculaire stoffen  
Chapter 5 Zouten en zoutoplossingen  
Chapter 6 Reacties van zouten

The block ends with Test T1. The test lasts 100 minutes. The participant is allowed to resit the test once.

Exit qualifications: A10, A13, B1, B2, B3, B4, B5, C1, C2, C3, C4, C6, D1.

Number of classes: 11.

- Block 2: using the coursebook *Chemie Overal HAVO*, 4<sup>th</sup> edition. The topics relating to the exit qualifications listed below are taught using the following chapters from HAVO volume 5:  
Chapter 7 Koolstofverbindingen  
Chapter 8 Zuren en basen  
Chapter 9 Energieproductie  
Chapter 10 Polymeren  
Chapter 11 Duurzaam produceren

The block ends with Test T2. The test lasts 100 minutes. The participant is allowed to resit the test once.

Exit qualifications: A10, A11, A12, A14, A15, B1, B2, B3, B4, B5, C1, C2, C4, C5, C7, C8, D1, F1, F2, F3, G1, G3, G4, G5.

Number of classes: 11.

#### Required prior knowledge

Basic understanding of chemistry, HAVO3 level

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<sup>6</sup> HAVO5 = senior general secondary education level 5

**Exit qualifications**

For a detailed description of the exit qualifications, see Appendix 1 to the EER, in paragraph 5 of the Exit qualifications for Chemistry HAVO.

**Learning method**

Classes, either online or on location (3 hours x 26 sessions including tests, not including resits). The participant will also need to spend time on homework and self-study.

**Reading material**

*Chemie Overal HAVO*, 4<sup>th</sup> edition, volume 4 and volume 5  
BiNaS (Noordhoff, 6<sup>th</sup> edition, ISBN: 9789001817497)

**Assessment and exams**

Each block ends with a quick refresher of the material and a test. Each test lasts 100 minutes and counts towards 50% of the final grade. The participant has one opportunity to resit the tests at the end of the component. The tests are always taken on location.