B Aeronautical Engineering TER
34278

TER 23-24 Bachelor
TOI

Established as of September 1, 2023
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1 PART 1. INTRODUCTION

1. Contents of the TER

These Teaching and Examination Regulations provide students with information about teaching and testing of the B Aeronautical Engineering TER (CROHO-number: 34278). In this document, we refer to the Teaching and Examination Regulations as 'the TER'.

The TER also contains the rules that apply to teaching and testing.

The TER concerns teaching in the programme in all forms and variants, for both the September and February intakes.

As well as regular students (further referred to simply as 'students'), higher education programmes can include external students. Enrolment as an external student only entitles the student to take tests, not to attend classes. The TER only applies to students. The provisions relating to testing and examinations also apply to external students.

2. Organisation of this document

We expect students to be familiar with the contents of the TER. That does not mean that everyone has to learn the text by heart, but students who have general questions or problems should first check to see whether the TER can clarify the matter. Students can do a quick check for information by using the table of contents or the index. Note: the index does not indicate every single place where a word or concept is mentioned, but it does point to the place where the definition or key information can be found.

The TER applies to all students, regardless of when they first enrolled. This means that what was written in last year's TER does not automatically apply this year. Changes may have been made. Students who have to repeat or make up a component from a previous year therefore cannot assume that everything will still be the same. It is important to check the content, procedures and rules for this year in good time.

As much as possible, we explain the concepts that we use in this TER within the part of the text that deals with that concept. But we sometimes need to use a concept that we haven't already explained. In that case, you can use the index to find the definition of the concept.

The TER consists of ten parts. Most of these are further divided into chapters. All topics covered by the chapters have a heading in bold. These headings appear in the table of contents. These components (articles) are numbered sequentially, from Article 1 to Article 185.

2 PART 2. THE EXAMINATION BOARD AND THE TER

3. The Examination Board

The programme has an Examination Board. More information on the Examination Board can be found on Iris.
Chapter 2 of the Education Guide contains a comprehensive explanation of the duties and powers of the Examination Board.

The university believes it is important to have professionally run Examination Boards which:

/ are conscious of their independent and expert task of keeping a 'watchful eye' over the programmes, to ensure they are at an appropriate level of higher professional education;

/ perform their work in accordance with the applicable laws and regulations; and

/ occupy a strong position as an independent advisory body for the faculty director and programme management.

The TER describes the duties and powers of the Examination Board just as they are described in the Dutch Higher Education and Research Act (Wet op het hoger onderwijs en wetenschappelijk onderzoek, or WHW).
In individual cases, the Examination Board may decide to deviate from a rule in this TER.

Students must always submit a request for a deviation. Via this link students can read how and to whom they can submit requests. If there are special or personal circumstances, students should mention these as soon as possible to the student counselor.

The Examination Board handles requests only if they are submitted within the specified timeframe. If no timeframe is specified, students may submit requests at any time. Requests should be submitted as soon as possible. The Examination Board needs time to properly consider requests.

The Examination Board will specify the requirements that requests must meet and the supporting documents that must be included with requests.

For some matters, the TER specifies a timeframe within which an Examination Board will make its decision. The timeframe is expressed in working days. 'Working day' means any day from Monday up to and including Friday. The following days are not working days:

- public holidays set by the government;
- days on which the university is closed, as specified in the annual calendar.

For other requests and complaints, the decision-making timeframe is specified in the digital form which students must use to submit their request or complaint.

If a request is incomplete or was not submitted in the correct manner, the timeframe will start to run only when:

- the request has been correctly submitted;
- and the student has supplied all necessary information.

4. Disagreeing with a decision made under the TER

In Chapter 2 of this Education Guide and on Iris, under Knowing & Arranging, Objection and Appeal, students can find a list of decisions by the Examination Board, an examiner or the faculty director, against which a student can lodge an appeal or objection. It is also explained what 'objection' and 'appeal' mean and what the procedure is.

For all decisions that are subject to objection or appeal, the process and timeframes for submitting an objection or appeal are specified.

3 PART 3. TEACHING

Chapter 1. Objectives and professions for which students are trained

5. Objectives, professional requirements and degree

The programme trains students to develop initial ability into professionalism. The programme has been set up in such a manner that the students can achieve the objectives with regard to knowledge, attitude, understanding and skills. Hereinafter, we refer to these four attributes as 'final qualifications'.

On receipt of the degree certificate, the degree for the Aeronautical Engineering programme will be awarded to the student.

Developments in society

Society is in a state of constant flux, requiring a well-developed adaptability from all of its members. Adaptation is not easy and requires a positive attitude towards life-long learning. Adaptation is also difficult because of the decline of common values, requiring each individual to find their own path.

Inholland University of Applied Sciences wants to deliver graduates who will function well in the fast changing and complex society of the 21st century. This means that graduates need to demonstrate a wide professional competency and be able to contribute to their own ongoing competence development.

The widely applicable competencies are important for all students given the rapid developments within professions and the continuous emergence of new professions in the job market .

Developments in the professional field

The high technological, operational and social requirements set for aeroplanes have lead to businesses in the Netherlands focusing on particular aspects of this industry. A significant number of businesses offer a suite of products and/or services, thus acquiring a nationally and internationally competitive position. The activities of the Dutch aviation industry are predominantly focused on:

The operation and maintenance of aeroplanes and helicopters;

The overhaul and maintenance of aeroplane engines and components;

The design and/or production of structural components and mechanisms;

The design and/or production of electric, electronic, electromagnetic, hydraulic and air-conditioning (sub)systems;

Retrofitting existing aeroplanes with new products;

The design and construction of interior compartments;

Research and development.

Given the international character of the industry, Dutch businesses are not significantly bound to a particular region, although there is a concentration of businesses close to Dutch airports. The specialisation of the industry has resulted in aeronautical engineers who work for these businesses choosing a particular specialisation at the beginning of their careers. In addition, all industrial activities are oriented towards a larger (international) whole: the design, construction and maintenance of aircraft. These developments mean that it is increasingly important for businesses to retain engineers who have knowledge of the aircraft as an integrated technical system and of its operational use. In addition, engineers must be able to analyse aspects of the aircraft and to identify the impact subsystems have on each other and on the aircraft as a whole.

Core tasks within the profession

A starting engineer will initially work under the direct supervision of an experienced employee and become familiarised with the business through working on less difficult assignments. This orientation process is dependent on the opportunities within the business. Some (smaller) businesses are faced with under-staffing due to business growth, meaning that novice engineers are quickly thrown in the deep end; other businesses offer a less intense introductory route.

Successful transition to other functions in the organisation is strongly dependent on the organisational structure of the company or division as well as the engineer's individual capacities and wishes. The engineer's role grows more difficult with time, due to an increase of both the complexity of tasks and the responsibility. In addition, in the longer term it is often expected that alongside technical matters an engineer will increasingly work on quality aspects, logistics, financial and policy issues, (project) management and customer acquisition.

Engineers are expected to undertake all tasks in a systematic manner, demonstrate accuracy in their work and show initiative. They are critical concerning their own practice and throughout their career continue to develop both technical and personal skills.

Current developments in the industry require engineers to display a flexible and customer-focused attitude. They must be able to work in teams and demonstrate an ability to communicate with specialists in the fields of both technology and business administration.

Possible (starting) roles an aeronautical engineer might undertake in this industry and the particular requirements for each are in the fields of:

- *Operation and Maintenance* (Maintenance Engineer, Reliability Engineer, or Systems Engineer);
- *Design* (Manufacturer, Design Engineer, Junior Product Engineer, or Research & Development Engineer);
- *Production, Production Preparation and Manufacture* (Production Set-up Supervisor, Research & Development Engineer, or Builder);
- *Follow-up care / Customer support;*
- *Supervision and monitoring of airworthiness.*

Chapter 2. Form and structure of the programme

6. Study load

The study load of a programme is expressed in credits. Each credit represents an average of 28 hours of study. These credits are equivalent to the European Credits (ECTS) used in European higher education institutions.

The study load is:

Bachelor's programme: 240 credits (foundation phase 60 credits, main phase 180 credits).

7. Foundation phase and main phase

The Bachelor's programme is divided into a foundation phase and a main phase.

In the foundation phase, students discover the content of the programme, the profession and what final qualifications are necessary for the programme. The purpose of the foundation phase is orientation, referral and selection. The foundation phase ends with the foundation examination. Students pass the foundation examination if they have completed all units of study of the foundation phase successfully. See also Article 9. Units of study.

The main phase follows after the foundation phase. The main phase ends with the final examination. Students pass the final examination if they have successfully completed all units of study in the main phase.

8. Joint foundation year

The programme does not have a joint foundation examination.

9. Units of study

The programme is divided into units of study. Each unit of study consists of educational activities that:

- aim to help students acquire knowledge, skills, understanding, attitudes and reflection;
- relate to each other and form one entity.

The study load of a unit of study is expressed in whole credits.

A unit of study may be further divided into modules.

A module is a part of a unit of study for which a test applies.

Students complete each unit of study with one or more tests. See also Articles 93. Oral tests and 94. Other types of tests.

Chapter 3. Basic curriculum, specialisation, main subject,

10. Basic curriculum

Every programme has a basic curriculum. This consists of the units of study that are mandatory for all students. In addition to the basic curriculum, students are presented with a range of additional optional subjects.

A Bachelor's programme can have specialisations or main subjects, or both. Programmes can also have different forms and variants.

11. Specialisation

The programme has no specialisation.

12. Main subject

A main subject has a narrower focus than a specialisation. Students take a set of units of study, which:

- are linked to one another;
- relate to a specific profession or discipline or a focus area within a profession or discipline.

Main subjects appear on degree certificates.

The programme has the following main subjects:

- Design and Development
- Lightweight Structures
- Precision Engineering

13. Optional subjects

The programme Aeronautical Engineering offers optional subjects. In year 4 students can choose the following minors:

- Gas Turbines minor;
- Space Engineering minor.

14. Form: full-time, part-time, dual

Programmes are offered in full-time form, in part-time form and/or in dual form.

- With a **full-time programme,** the teaching is arranged so that students spend 1,680 hours per year on their studies, spread over 42 weeks.
- A **part-time programme** is set up so that the studies can fit in with a job, in the evenings or for a few hours in the daytime. Sometimes requirements apply to the job. Students cannot follow a part-time programme if they do not meet these requirements.
- With a **dual programme**, students work during their studies, or during parts of their studies. Their work is part of the programme, the 'professional component'. Students get credits for this part, provided they get a good evaluation.

The structure of the curriculum and the content of the units of study may differ between the various forms. But the final qualifications (learning outcomes) that students ultimately achieve and the total study load are the same for all forms.

Aeonautical Engineering only offers a full-time programme.

15. Programme variants

Programmes can have different variants. The variants for the B Aeronautical Engineering TERprogramme are:

Aeronautical Engineering is a variant of the programme that is offered in English during the entire curriculum of year 1 till 4.

Aeronautical Engineering does not offer a flexible track.

The structure of the curriculum and the content of the units of study may differ between the variants, but the final qualifications (learning outcomes) that students ultimately achieve are the same for all variants.

16. Honours programme

The programme does not offer an honours programme.

17. Additional programmes

The programme does not offer an additional programme.

18. Transition from Bachelor's to Master's programmes

Does the Bachelor's programme have a transition programme for moving on to its own Master's programme, or to a Master's associated with another programme or at another institution?

The Bachelor's programme does not have a transition programme for moving on to its own Master's programme, or to a Master's associated with another programme or at another institution.

19. Transition from Ad to Bachelor's programmes (not applicable to Bachelor's programme)

This Article is not applicable to the Bachelor's programme. The Ad programme has a separate TER.

Chapter 4. Programme structure, content and evaluation

20. Terms and calendar

The academic year consists of four teaching periods of approximately ten weeks each. There may be a fifth period. It then runs from mid-July to the end of August. In the main phase, a year can also consist of two teaching periods of approximately 20 weeks each.

The appendix "Description units of study Aeronautical Engineering" describes the educational programme per year and per term.

21. Curriculum obsolescence and updating

The programme curriculum is updated regularly. The changes may be minor or major. Minor changes do not result in units of study or modules being renamed.

Changes effective from 2023-2024:

- The following tests do return in the new program under a new name and equivalent course code:
  - 1610AE102A Advanced CATIA (replaced by 1621AE102A Advanced CAD)
- The following tests do not return in the new program. In the academic year 2023-2024, students have two more test opportunities to complete the unit of study:
  - 1617LTI03A Graduation Proposal
  - 1617LTI03C Study Coaching

Changes effective from 2022-2023:

- The following tests do return in the new program under a new name and equivalent course code:
  - 1612LTK01A Mathematics 5 (replaced by 1621LTK01A Linear Algebra)
  - 1612LTK08A Mathematics 6 (replaced by 1621LTK08A Differential Equations)
  - 1612LTK06A Thermodynamics (replaced by 1621LTK20A Thermodynamics and Propulsion)
  - 1610DD303Z Space Engineering (replaced by 1622SE102Z Space Propulsion)
- The following tests do not return in the new program. In the academic year 2022-2023, students have been offered two more test opportunities to complete the unit of study:
  - 1613LTP08B Materials 1: Practical

- 1616LTP18B Windtunnel Exercise 1
- 1614LTK02B Mechanics Practical
- 1612LTK05B Composites Practical Skills
- 1612LTK15B Control Theory Assignment
- 1612LTK12B Aircraft Performance: Practical
- 1616LTK19A Aerodynamics 2
- 1612LTK04A Materials 2
- 1612LTK07A Aerodynamics 3
- 1616LTK18A Design Project
- 1612LTK16A Aircraft Systems
- 1612LTK06B Thermodynamics Practical
- 1612LTK13A Aircraft Gas Turbines
- 1612LTK14A Aerodynamics 4
- 1617LTKC1A Second Year Study Coaching
- 1616LTK20A Build and Test Project

22. Expiry dates of units of study and modules

Major changes result in the setting of an expiry date. The expiry date is the last date on which the unit of study or module, with the associated test(s), will form part of the programme curriculum.

If a module has an expiry date, the entire unit of study will expire on that date. Modules that are part of that unit of study but are not scheduled to expire will be incorporated into other units of study. The same applies to any test results or exemptions associated with the module. That other unit of study may be an existing unit of study or a new unit of study.

If a module is incorporated into another unit of study, a new weighting of its test will be set for the purpose of determining the final grade for that unit of study. See also Article 127. Grade for a unit of study.

This academic year, the programme has units of study with an expiry date. An overview of these units of study and the expiry dates can be found in article 21 above.

23. Expiry date, transition period and validity period

The expiry date will be the last day of an academic year. We will announce the expiry date by no later than the first day of the next academic year. Depending on the timing of the announcement, a transition period may be added to the expiry date, by adding '+1 yr' or '+2 yrs'.

If students have already attended some of the classes for the unit of study that is going to expire, they are entitled to education based on the old programme as preparation for the associated tests, for the duration of the transition period. During that period, they are also entitled to sit the associated tests.

If they do not complete the entire unit of study within the transition period, they will have to attend the replacement classes instead, and sit the replacement tests.

An overview of the expired units of study and the expiry dates can be found in article 21 above.

If an expiry date has an associated transition period, the tested knowledge, understanding or skills may be demonstrably obsolete. If this is the case, it will be stated under the module or unit of study in question.

Students who had already completed this component of the unit of study must bear in mind that their test results will have limited validity. See also Article 146. Limited validity period for tests and exemptions and following.

If students do not succeed in completing the entire programme within the validity period applicable to them, they will have to attend the replacement classes instead, and sit the replacement tests.

24. Evaluation of the programme

The faculty works with two quality cycles that both consist of four steps of Plan-Do-Act-Check (PDCA).

The 'small'quality cycle focuses on monitoring and improving the results per eduational term or semester. (four or two times per

academic year). After every term the teaching staff as well as the students discuss their analyses and points of improvement.

The 'large' quality cycle focuses on the integration of the different evaluations conducted in one academic year. It integrates the evaluations of the students, workfield, alumni and employees. and gives an overview of all these results.

4 PART 4. ADMISSION

Chapter 1. Admission to the foundation phase

25. General rules of admission

The rules on admission to the foundation phase are set out in the Rules on enrolment and deregistration of Inholland University of Applied Sciences. This document can be found on the website and on Iris and is briefly discussed in Chapter 2 of this Education Guide. If prescribed by the WHW, these rules are included in the Rules on enrolment and deregistration. This applies at any rate to:

- the entrance examination;
- the examination for persons aged 21 years or older who do not meet the admission requirements (21+ examination);
- the prior education and entrance requirements for students who do not come from a country in the European Economic Area (EEA);
- the requirements for enrolling in a programme that will be partly or entirely taught in the English language.

26. Admission following an interruption in enrolment

Students whose programme was interrupted by deregistration and who wish to re-enrol must ask the programme upon re-enrolment which results they have already achieved and to what extent these fit in with the programme as it applies at the time of re-enrolment.

The programme will let these students know in writing what additional classes and tests they must take to match up with the tests they have passed and which exemptions they have. The students must also comply with the other rules for enrolment and deregistration.

Enrolment for a programme that is being phased out is not possible.

27. Admission to a part-time programme

The programme has no part-time form.

28. Admission to a dual programme and work-study agreements

The programme has no dual form.

Chapter 2. Admission to the main phase

29. Admission to classes and tests in the main phase with a foundation certificate awarded by Inholland

To be admitted to the main phase, students need either a foundation certificate from the programme or a joint foundation phase exam that also applies to the programme. The faculty director may determine in this respect that a student will not be admitted to one or more specialisations or main subjects. More information is provided in Article 38. Exclusion from main subjects or specialisations.

Generally speaking, admission to the main phase means that students are admitted to all units of study and tests. However, for some units of study additional conditions apply before students can take classes or sit tests. More information is provided in article 31a. Students must meet these conditions before they can take part in those units of study.

Careful thought has been given to the structure of the curriculum and the order of the units of study. However, students are not required to follow this order.

30. Admission to the main phase with a foundation certificate awarded by another institution of higher professional education

If students have a foundation certificate from another institution of higher professional education, the Examination Board will assess for which units of study they may be offered an exemption or whether they can start the main phase straight away.

The Examination Board will make its decision within 30 working days after receiving a complete request.

31. Admission to main phase classes and tests without a foundation certificate

If the student does not yet have a foundation certificate and has also not met the binding study recommendation standard, they can still attend the units of study in the main phase/the second year. If special conditions apply to participation in a unit of study, students can only attend the unit of study if they meet these conditions.

31.a Entry and transfer requirements for units of study from the second year

Entry requirements for the course units, where relevant, are mentioned in the course specific information. This information can be found in the appendix "Description units of study Aeronautical Engineering".

For internship (work placement) and graduation programme, see also articles 35 and 36, respectively.

For graduation tracks (main subject) and minors (optional subjects), see also article 37.

Chapter 3. Switching

32. Switching between forms and variants

Switching between forms and variants within a programme is allowed. Students must comply with the conditions for admission and enrolment that apply to the form or variant to which they wish to switch.

The Examination Board will determine how students' test results and exemptions will be incorporated into the form or variant to which they are switching.

33. Switching between programmes with a joint foundation examination

With a joint foundation exam, students are enrolled in one specific programme, and their results are recorded towards that programme.

If students switch to another programme with the same joint foundation exam before completing their foundation phase, they retain their results and exemptions from the foundation programme. These are transferred to the new programme, with the dates on which the results were achieved being maintained.

If students switch programmes after receiving a foundation certificate, no new foundation certificate will be awarded for the new programme.

Any warnings issued as part of the binding study recommendation remain applicable after a switch.

If students have received a binding study recommendation for one of the programmes with a joint foundation exam, they cannot switch to another programme with the same joint foundation exam.

34. Switching between Ad and Bachelor's programmes

Students cannot switch from an Ad programme to the Bachelor's programme.

Chapter 4. Admission to work placements and graduation programmes

35. Work placements

Students require permission from the programme to be able to start a unit of study that includes a work placement component. Permission is granted through the signing of a placement contract by or on behalf of the faculty director.

If other conditions apply to participation in the unit of study, students must meet these as well before they can participate. The programme deals with these conditions with leniency.

A student is only allowed to start the Engineering Internship when, before the start of the internship

- the student can realistically be expected to obtain at least 110EC in the first two years of the curriculum,
- and the student has completed the first year of the curriculum.

The decision on whether a student is allowed to start the internship will be taken by the internship coordinator. Also, the internship assignment must be approved by the internship coordinator.

36. Graduation programmes

Students require permission from the programme to be able to take a unit of study that is part of a graduation programme. The graduation programme consists of units of study with one or more graduation products.

A student is only allowed to start the graduation project when, before the start of the graduation project

- the student can realistically be expected to obtain at least 200ECs,
- and the student has completed the first and second years of the curriculum,
- and the student has completed the third year internship.

Students who are allowed to start their graduation project can start in any of the four educational terms. The decision on whether a student is allowed to start the graduation project will be taken by the graduation coordinator in the fourth week of the educational term prior to the intended start of the graduation project.

Chapter 5. Admission to optional subjects, main subjects and specialisations

37. Optional subjects

Aeronautical Engineering students choose a graduation track (Design and Development or Lightweight Structures) in the third year of study.

Besides continuing with the chosen track of year 3, in year 4 students can choose to do one of the following (internal) minors instead:

- Gas Turbines minor;
- Space Engineering minor.

Furthermore there is the option of external (inter)national minors as part of the first semester of year 4.

A student is only allowed to start the graduation track or minor (internal or external) when, before the start of the graduation track or minor

- the student can realistically be expected to obtain at least 110EC in the first two years of the curriculum,
- and the student has completed the first year of the curriculum,
- and the student has completed the third year internship.

Requests for participation in the graduation tracks have to be filed and approved by the respective graduation track coordinator.

Requests for participation in the internal minors have to be filed and approved by the respective minor coordinator.

Requests for participation of external minors have to be filed and approved by the exam board.

For both internal and external minors, the request for participation has to be accompanied by a formal motivational letter of about 1 A4 (see also article 43).

38. Exclusion from main subjects or specialisations

Students select a main subject and specialisation from the range offered by their programme. However, the faculty director may decide not to allow a student to take a main subject or specialisation, if differences in the nature and content of that main subject

or specialisation justify such a decision.

In making the decision, the faculty director takes into consideration the study results, the programme as followed by the student, or both, and the relationship between these and the content of the main subject or specialisation.

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39. Participation in more than one main subject or specialisation

If students wish to participate in more than one main subject or specialisation, they must indicate in advance to the Examination Board for which main subject or specialisation they wish to take the final examination. The choice for one particular graduation track is specified on the certificate. The other choice is extracurricular. This means that this choice is not part of the programme itself. Specialisations are not reported on the certificate. All units of study that the students have successfully completed will be included in the list of grades and the diploma supplement.

Chapter 6. Admission to optional subjects

40. Optional subjects

Admission to optional subjects is detailed in article 37.

41. Optional subjects package

Optional subjects will be offered as a package because this is necessary to achieve the final qualifications (learning objectives) for the programme. The students are required to select the entire package.

The name of the package only appears on the list of grades and the diploma supplement, if students have completed the entire package.

42. Exemption and substitution of optional subjects

Students can request an exemption from the Examination Board if they have taken certain tests as part of another programme. In this case, they must choose an optional subject first and then apply for an exemption. Chapter 18. Exemptions, particularly Article 160. Exemptions procedure and evidence, contains more information about how students can apply for exemptions and the requirement that they must state the reasons why they need an exemption.

Students can also request the Examination Board to grant them permission to take other units of study that allow for national and international mobility. These are known as 'substitute units of study', as explained in Article 167. Request for substitution and following Articles.

43. Permission by the Examination Board for optional subjects

If students choose an optional subject that is not offered by their own programme, they must first discuss the choice with their study counsellor.

They must then submit a request to the Examination Board. In the request, they must indicate:

- how the choice aligns with the profile of their programme in terms of final qualifications (learning objectives) and level;
- how the choice relates to the phase of the programme in which they are making the choice;
- how the choice fits in with their personal goals.

The Examination Board will make a decision within fifteen working days.

44. Changing a selected optional subject

Students can change their choice of optional subject at any time up until five weeks at the latest before the start of term. To do so, they must repeat the procedure set out in Articles 42. Exemption and substitution of optional subjects and 43. Permission by the Examination Board for optional subjects.

45. Extra optional subjects

Students can obtain extra credits by taking more optional subjects than provided for in the graduation programme. In this case, they must let the Examination Board know which units of study are extracurricular. These units of study do not form part of the final examination.

Students who choose to take extra optional subjects are recommended to take note of the provisions of Articles 175. Degree certificate and 177. Deferral of awarding of the degree certificate when deciding on the order in which to complete the optional subjects. These articles determine when a degree certificate will be awarded and when the awarding of the certificate will be postponed.

5 PART 5. APPLYING FOR UNITS OF STUDY

Chapter 1. Applying for units of study in the basic curriculum

46. Applying for units of study

Students do not need to apply to take units of study in the basic curriculum. However, applications are sometimes necessary for the organisation of the programme, for instance in the case of field trips. Where an application is required, it will be stated in the unit of study description.

Students will be informed as quickly as possible as to whether they can take the units of study for which they have applied. They will receive this information at least two weeks before the unit of study is due to start.

If there are more applicants than places, students will be placed in the order in which they applied. Students for whom the unit of study is an integral part of their basic curriculum will be given preference ahead of students for whom this is not the case.

Students who cannot be placed will be offered an alternative option.

Chapter 2. Applications and placement for optional subject

47. Applying

Students must apply in good time to take optional subjects.

The information provided on optional subjects will specify how and when students can apply.

If a minimum number of students is necessary in order for an optional subject to go ahead, this will be announced in advance. Students will also be notified in advance if there is a cap on student numbers for an optional subject.

Students who were previously admitted to an optional subject but did not start it must apply again, stating ‘previously admitted’ as their reason.

48. Placement

Students who apply for optional subjects in good time and according to the correct procedure will be placed in those optional subjects, unless there are too many or too few applications. For Study Abroad, other guidelines apply for the placement. For more information, check the student handbook Study Abroad, 31.a Entry and transfer requirements for units of study from the second year, 37. Optional subjects or article 40. Optional subjects.

At least six weeks before the start of term, students will be notified whether they have been placed in their optional subjects. If they have not been given a place, they will be notified of the reasons for this, and also how and within what timeframe they can make a new choice.

Note: Placement alone is not always in itself sufficient for a student to be able to take a unit of study. If other conditions apply for participation in the unit of study, students must meet these too.

49. Too few applications

If fewer than the minimum number of applications are received, the faculty director responsible for that optional subject may decide not to allow the unit of study to go ahead. In that case, the faculty director will offer the students who applied for the optional subject one or more alternative options. Where possible, this will include the option of taking the same or a similar optional subject at another location.

50. Too many applications

If too many applications are received, students will be placed in the order in which they applied. Applications for optional subjects that are not extracurricular will be given priority. See also Article 45. Extra optional subjects. The faculty director will offer students who are not given a place one or more alternative options. This may include the option of taking the same or a similar optional subject at another location.

For Study Abroad, other guidelines apply for the placement. For more information, check the student handbook Study Abroad, 31.a Entry and transfer requirements for units of study from the second year, 37. Optional subjects or article 40. Optional subjects.

6 PART 6. STUDY COUNSELLING

Chapter 1. Study counselling

51. Mandatory component of the programme for all students

Every student will receive study counselling and have a study counsellor.

Study counselling is a mandatory component of the programme. It is related to the student's academic phase. It is also possible to receive advice and counselling regarding personal circumstances – see the Student Counsellor page on Iris.

52. Content of study counselling

At a minimum, study counselling includes:

- guidance on choices during students' studies;
- academic progress;
- the study recommendation.

Students can view their own academic progress electronically.

Students elect an Aeronautical Engineering programme at the higher professional education level, grounded in competence-based learning. Apart from gaining knowledge, this entails the acquisition and development of skills, insight and attitudes. Altogether this results in the graduate's ability to act appropriately in critical professional situations and to reflect on this. Study coaching and career coaching assist students in this process.

Through career coaching students learn to manage their own careers. They learn to recognise and utilise their strengths, identify their limitations and create an action plan based on this knowledge. During project meetings, competence development and choices are discussed. The project coach supports students in this. Career coaching continues through all the years of the study and is one of the aspects covered during the projects.

Within the career coaching learning line, students learn to direct their own careers independently. With career coaching, students learn to set goals in order to achieve the appropriate competences and are challenged to make conscious choices during their studies. It is all about looking ahead, taking pause and looking back. 'Looking ahead' is when choices need to be made, for example regarding an internship position. 'Taking pause' is to check if studies are progressing sufficiently. 'Looking back' is to learn from things that have gone well, but also from things that have not gone well: how can students ensure that these do go well in future?

Through discussions with their project coach, among other things, students gain insight into their own learning style and what drives them (or what does not). Students learn to identify their own personal qualities and points for development. Based on this, feasible learning goals can be set and work can be planned better for optimal progress, which is an important focus point.

Besides the project coach, the faculty has appointed a study advisor who is available for study plans, study delay and 'long study students'.

Chapter 2. Recording data as part of study counselling

53. Recording data in study counselling

For each student, the study counsellor will record the agreements made during study counselling sessions. For disabled students, the study counsellor will also record the relevant agreements they have made. The same applies to agreements with students enrolled as elite athletes.

Students will be given a copy of these agreements on request. For disabled students, more information is given in Article 107.

Disability and for elite athletes in Article 66. Adjusted standards for elite athletes and Chapter 2 of this Education Guide.

Students are entitled to view the information recorded about them.

7 PART 7. STUDY RECOMMENDATION AND BINDING STUDY RECOMMENDATION

Chapter 1. Study recommendation

54. Content of study recommendation

At the end of the first year of enrolment in the foundation phase of the Bachelor's programme or the Ad programme, students receive a positive or deferred study recommendation in writing from the faculty director relating to the continuation of their studies within the programme or elsewhere. This study recommendation is based on the test results recorded in the PeopleSoft academic monitoring system.

Where necessary, the study recommendation will include a warning or a rejection. More information on a warning is given in 77. Warning, and more information about rejections is contained in Articles 56. Quantitative academic performance standard to 63.

The study recommendation applies to all forms and variants of the programme. If a student switches from one form or variant to another and the programmes are different, the faculty director will adjust the study recommendation after the switch if necessary.

55. When study recommendations will be issued

The student who enrolled in September will receive the study recommendation by 31 July at the latest. The student who enrolled in February will receive the study recommendation at the latest by the first of March of the second year of enrollment.

The study recommendation contains a recommendation of the first twelve months of the study, to and including 31 January.

Students who enroll on any other date than 1 September or 1 Februari will receive their study recommendations:

- at the latest on 31 July 2023 for cohort 21-22 and cohort 22-23 if they started in the September intake;
- at the latest on 1 March 2024 for cohort 20-21 and cohort 22-23 if they started in the February intake.

The standards for the study recommendation are set out in Article 67. Different standard for interim entrants.

Chapter 2. Binding study recommendation in the first year of enrolment

56. Quantitative academic performance standard

a. Level of the quantitative academic performance standard

At the end of the first year of enrolment in the programme, students must have obtained at least 45 of the 60 available credits in the foundation phase. When students have obtained at least 40 credits, of which 25 credits in period 3 and 4, the quantitative standard has been met. Please note: this is a pilot.

b. Quantitative academic performance standard where exemptions have been granted

If students have been granted exemptions from the tests for one or more units of study, the quantitative academic performance standard will be 84% (50/60) of the remaining number of credits in the foundation phase. This rule also applies to the accelerated

curriculum for students with a pre-university education.

the quantitative academic performance standard will be 75% (45/60) of the remaining number of credits in the foundation phase.

57. Qualitative academic performance standard

The programme has no qualitative standard for the binding study recommendation.

58. Issuing of binding study recommendation

Students must meet the quantitative academic performance standard by the end of the first year of enrolment. If the programme has set a qualitative academic performance standard, students must also meet that standard. If students meet the academic performance standard by the end of the first year of enrolment, they will receive a positive binding study recommendation. If students do not meet the academic performance standard by the end of the first year of study, the binding study recommendation will be postponed. Students from cohort 2021-2022 will have the opportunity until 31 July 2023 (September intake) or 1 March 2024 (February intake) to meet the academic performance standard as set out in article 61. No advice from the student counsellor is required in this respect.

59. Binding study recommendation and personal circumstances

The faculty director will not issue binding study recommendations where students have not been able to comply with the standards for binding study recommendations due to personal circumstances. The procedure for providing evidence of personal circumstances is set out in Articles 82. Personal circumstances and 85. Definition of personal circumstances.

If the programme has set a qualitative academic performance standard and the student has not achieved that standard, and if the personal circumstances which prevented the student from achieving the quantitative academic performance standard did not present an obstacle to meeting the qualitative standard, the faculty director will always issue a negative binding study recommendation.

60. Binding study recommendation and switching out of the accelerated variant

This article does not apply to the programme B Aeronautical Engineering TER.

Chapter 3. Binding study recommendation after the first year of enrolment

61. Standard for a binding study recommendation after the first year

If a student did not meet the minimum standard (quantitative and possibly qualitative) at the end of the first year and the faculty director could not provide a binding study advice, then they must pass the entire first-year program during or by the end of the second year of enrollment or within the given deadline.

This applies to students:

- For whom a binding study advice could not be given due to personal circumstances;
- Who did not receive a binding study advice because their enrollment was interrupted. See also article 69. Binding study recommendation following an interruption in enrollment;
- Who had a significant backlog for the first time at the end of the fourth educational period, and it became apparent that there was a backlog. See also article 77. Warning;
- Whose examination results after the first year clearly indicate the student's suitability. See also article 62. When a binding study recommendation will be issued after the first year.

62. When a binding study recommendation will be issued after the first year

The faculty director will issue a binding study recommendation upon determination that the student cannot successfully complete the remainder of the first-year programme within the timeframe granted to the student.

The faculty director will not give a negative binding study recommendation if there are personal circumstances; see also Article 82. Personal circumstances. It is necessary that the student counsellor issues advice.

The faculty director will give a positive recommendation if the test results for the programme after the first year clearly indicate the student's suitability.

63. Extending the timeframe

It is possible that, due to personal circumstances, a student may not receive a binding study recommendation during or at the end of the second year of enrolment but will instead receive a warning stating a timeframe. If it subsequently becomes apparent that the student is unable to meet the standard within that timeframe, the faculty director will issue a binding study recommendation at the end of the timeframe specified in the letter. If relevant personal circumstances still exist, the faculty director will again take the severity of these circumstances into account. See also Article 82. Personal circumstances.

Chapter 4. Consequences of a binding study recommendation and when enrolment will end

64. Termination of enrolment

Students who have received a binding study recommendation from Inholland cannot continue with the programme. Their enrolment will be terminated.

65. When the enrolment will end

If a binding study recommendation is issued after 1 June, the enrolment will end on 31 August.

If a binding study recommendation is issued earlier in the academic year, the enrolment will be terminated at the time immediately after the end of the last day of the month in which the binding study recommendation was issued. If there are only a few days remaining between the issuing of the recommendation and the last day of the month, the student's enrolment will be terminated one month later.

Chapter 5. Special cases and binding study recommendation

66. Adjusted standards for elite athletes

An elite athlete is a student who meets the conditions set out in the Profile Fund Regulations. These regulations can be found in this Education Guide in Chapter 3.3.

In addition to the provisions of Article 85 h, the faculty director may make an agreement with an elite athlete setting adjusted standards for the first year of enrolment. This will be done as soon as possible after enrolment. The faculty director will send the student a letter setting out the agreements. The faculty director may appoint someone else to make the agreements and send them to the student.

67. Different standard for interim entrants

No different standard applies to interim entrants.

Quantitative academic performance standard

The faculty director will determine which credits the student will be unable to achieve upon entering in the interim, in light of the scheduling of the classes and tests. This number will be deducted from the first-year study load. (The first-year study load is 60 credits for the regular programme and 45 for the accelerated variant.) The student must achieve 84% of the difference in the first year of enrolment. This number will be rounded up.

If the student has exemptions, the percentage will be applied on the total number of credits minus the number of credits for the units of study for which the student has exemptions, and minus the number of credits that the student will be unable to achieve due to the scheduling of classes and tests. This number will be rounded up as well.

Qualitative academic performance standard
If there is a qualitative academic performance standard, the number of credits for the units of study that form part of the standard and that the student cannot achieve due to entering in the interim will be deducted from that standard.

Soon after the intake, the faculty director will determine what the quantitative and qualitative academic performance standards will be. The faculty director will consult the student first, and then send the student a letter setting out the standards.

68. Binding study recommendation and switching to another programme

If students switch to another Bachelor's programme or Ad programme, the rules of the binding study recommendation will again apply to the new programme.

Important note: After receiving a binding study recommendation, students cannot switch to a programme with the same foundation exam. It is also not possible, after having received a binding study recommendation, to switch from an Ad programme to a Bachelor's programme (or vice versa) with the same foundation exam. The standards for binding study recommendations are set out in Article 56. Quantitative academic performance standard and 57. Qualitative academic performance standard.

After receiving a binding study recommendation, students cannot transfer credits that they obtained in the old programme to the new programme. However, they can apply to the Examination Board for an exemption from tests if they meet the applicable conditions. See also Articles 155. Exemptions from tests to 162. Waiving further investigation.

69. Binding study recommendation following an interruption in enrolment

Students who are deregistered less than two months after enrolment and re-enrol in the same programme in a subsequent academic year will be subject to the same rules around warnings and binding study recommendations as students enrolling in the programme for the first time.

If a student from the September intake terminates their enrolment before receiving a binding study recommendation and then re-enrols in a subsequent academic year, the binding study recommendation standard entails that they must pass the foundation examination in that year. When they enrol, the student will receive a warning notifying them of this fact.

If a student from the February intake terminates their enrolment before September of that year and then re-enrols in the same programme on 1 September, generally speaking the same rules will remain applicable to them regarding warnings and binding study recommendations. The quantitative academic performance standard may be adjusted in individual cases. If this is the case, it will be stated in the warning that the student receives at the time of re-enrolment.

If a student deregisters before the end of the academic year, and they could not have met the BSA standard anymore even if they hadn't deregistered, and if there are no personal circumstances as referred to in Article 85. Definition of personal circumstances, then a binding study recommendation will be issued.

The rules in this Article also apply if a student re-enrols for a programme with the same foundation exam as the programme in which they were previously enrolled.

Chapter 6. Academic progress and international students

70. Students to whom these rules apply

The rules in the following Articles (up to and including Article 75) concerning academic progress apply to students who:

1. do not come from a member state of the EEA or from Switzerland (these are students who require a residency permit); and
2. are covered by the 'Code of Conduct for International Students in Dutch Higher Education'.

These rules are in addition to:

- the rules on academic progress, study recommendations and binding study recommendations in this TER; and
- the academic progress requirements for students who receive a knowledge grant from the university under the Profile Fund Regulations.

71. Criteria

According to the Code of Conduct, students have made satisfactory academic progress if, in each academic year, they have achieved:

- at least 15 credits by participating in tests in the first two terms;
- at least 30 credits over the entire academic year.

72. Procedure at the end of Term 2 and Term 4

The faculty director determines students' academic progress twice each year:

- at the end of Term 2;
- and at the end of Term 4.

If a student is deemed to have made unsatisfactory academic progress after Term 2 and at the end of the academic year, their study counsellor will discuss this with them. If there are any special circumstances as referred to in Article 86. Other special circumstances, the study counsellor will make a reasonable agreement with the student to ensure that their academic progress is restored to the required level as quickly as possible. The student is required to comply with this agreement.

73. Procedure at the end of the academic year

If at the end of the academic year the faculty director finds that a student is no longer attending any classes at all, or their abilities are insufficient for the level of the programme, the university will report the student to the Immigration and Naturalisation Service (IND) within one month. The 'end of the academic year' is always the end of July/August, even for students from the February intake. If a student is failing to meet the progress standard that applies to them, this will be sufficient reason for determining that their abilities are insufficient for the level of the programme. This does not apply if the study counsellor has made an agreement with the student as described in Article 72. The faculty director will inform the student in a letter of his decision regarding the special circumstances relating to their failure to meet the required standard. This letter will include the faculty director's reasons, as well as information on how the student can appeal against the decision.

74. The university will refrain only once from reporting a student

Where the same set of special circumstances is involved, reporting an international student to the IND for unsatisfactory academic progress can be refrained from only once during the entire period in which the international student is enrolled at the university. The Central Student Administration makes the report on behalf of the faculty director.

75. Records

The faculty director makes a record of:

- the unsatisfactory academic progress;
- the personal circumstances; and
- the fact that no report was made.

Chapter 7. Procedure for issuing binding study recommendations

76. No binding study recommendations without prior warning

The faculty director must first give the student a written warning before issuing a binding study recommendation.

77. Warning

If a student's academic progress has been unsatisfactory during their first or second year of enrolment in the foundation phase, and as a consequence they are in danger of receiving a binding study recommendation, the student will receive a warning from the faculty director. The warning will be given in writing.

78. When the warning will be sent

The faculty director sends the warning in the first year during the term in which the students' poor academic progress is first noted, or as soon as possible after the end of that term.

If the faculty director only notices students' poor academic progress in Term 4, and is unable to issue a warning due to the resits at the end of that term, the students will receive a warning that they must successfully complete the full first-year curriculum in the second year of enrolment. The warning will form part of the study recommendation.

If a student cannot meet the standard for avoiding a binding study recommendation due to personal circumstances, they will receive a warning that the foundation phase must be successfully completed during or by the end of the second year. The warning will form part of the study recommendation.

79. Content of the warning

The warning will indicate the total number of credits that the student must obtain. The warning will also indicate the date by which the student must have obtained these credits.

The terms in which classes for the units of study in question will be run, and the timing of the tests, are taken into account upon setting this date. The rule is that there should be two test opportunities per academic year, unless one of the exceptions in 96. Number of test opportunities per academic year

If the student is subsequently given a new deadline due to personal circumstances, this applies only to the two test opportunities for the remaining units of study.

80. Scope of the warning

The warning applies to all forms and variants of the programme.

In the case of a joint foundation exam, the warning applies to all programmes with the same foundation exam.

If the programme is run in multiple locations, the warning applies to all locations.

However, if students switch from one form, variant or location to another, and the curriculum is different, the warning may be adjusted if necessary. If such an adjustment is made during the first year of enrolment, only the standard will be adjusted.

81. Warning in the case of re-enrolment following deregistration

If a student does not receive a warning because they have already deregistered, and if they re-enrol in the same programme, or in a programme with the same foundation examination, they will receive the warning as soon as possible after re-enrolment.

The standards for a 'Binding study recommendation following an interruption in enrolment', as described in Article 69. Binding study recommendation following an interruption in enrolment, will apply to the warning.

82. Personal circumstances

Students may fall behind in their studies due to personal circumstances. Article 85 outlines what those personal circumstances might be. The faculty director takes any personal circumstances into account when deciding whether to issue a binding study recommendation. The faculty director can only do this if he or she is aware of the personal circumstances. Accordingly, students must report personal circumstances to the student counsellor. The faculty director will always seek advice from the student counselling service before issuing a binding study recommendation. The student counsellor will provide written advice. In the advice, the student counsellor will address:

- whether the student has reported personal circumstances as defined in article 85. Definition of personal circumstances;

- if so, whether the student has delivered proof of the personal circumstances;

- whether the student counsellor can establish a connection between the personal circumstances and the study credit deficit of the student;

- if possible, for how many study credits the student has fallen behind due to the personal circumstances and/or which period or courses the deficit relates to.

The student counsellor will send the advice to the faculty director and to the student. The faculty director will also consult the

study counsellor about students' academic progress and its connection to their personal circumstances.

83. Meeting

Before a binding study recommendation is issued, students will be offered the opportunity to explain their side of the story to the faculty director or to someone else assigned to meet with students on behalf of the faculty director. Among other things, this meeting will include a discussion of whether the overview of academic results achieved is accurate. The participants of the meeting will also look at whether the personal circumstances should be taken into account.

If a student fails to take up an invitation to attend such a meeting, this will be noted in their student file.

Chapter 8 Request for lifting a binding study recommendation

84. Lifting

Students who have received a binding study recommendation may submit a request to the faculty director to review the rejection.

Such review by the faculty director can take place no earlier than twelve months after the date on which the enrolment was terminated due to the binding study recommendation. In their request, students must provide plausible arguments to show that they will now be capable of successfully completing the programme. These arguments can be based by the students on activities, which may include studies, that the students have engaged in since leaving the programme.

The faculty director will not review the rejection if the programme is being phased out or has been discontinued.

Chapter 9. Special and personal circumstances and academic progress

85. Definition of personal circumstances

The personal circumstances that can play a role in the decision of whether to issue a binding study recommendation as described in Article 82. Personal circumstances are:

a. student illness;

b. physical, sensory or other disabilities;

c. pregnancy of the student;

d. special family circumstances;

e. membership of a representative advisory council, faculty representative advisory council, student committee or programme committee at the university;

f. membership of an accreditation committee, as specified in Chapter 5a of the WHW;

g. membership of the board of a student organisation or other administrative activity, as explained in Article 2(3) of the Profile Fund Regulations, which can be found in the Education Guide;

h. competing as an elite athlete (see also Article 66. Adjusted standards for elite athletes);

i. personal circumstances not listed in (a) to (h) above, which, if the board of the university did not take them into consideration, would lead to a significant and unfair disadvantage.

86. Other special circumstances

In addition, the following provisions concerning the academic progress of international students (Articles 70. Students to whom these rules apply to 75. Records) and the validity period of results (Articles 146. Limited validity period for tests and exemptions to 148. End of validity period) apply:

1. a programme cannot be completed within the nominal time;

2. activities in the social sphere.

Students may also fall behind in their studies in a way that makes them eligible for financial assistance under one of the student financial support schemes as outlined in Chapter 3 of this Education Guide.

87. Procedure for establishing special and personal circumstances

a. Notify the student counsellor as soon as possible

If any of the circumstances set out in Articles 85. Definition of personal circumstances or 68. Binding study recommendation and switching to another programme arise and cause a student to fall behind with their studies, they should notify the student counsellor as soon as possible, stating:

- the period of time for which the circumstances applied or will apply;
- what the circumstances are and how serious they are;
- the student must provide evidence; the extent to which the student was or will be unable to participate in classes or tests.

All contacts with students are recorded in the student counselling information system. If students so wish, they can obtain a copy of everything recorded in the system about these contacts.

b. Student Counsellor's Declaration

The student counsellor will draw up a 'Student Counsellor's Declaration' if:

- a student has proven that personal or special circumstances are applicable; and
- the student counsellor has determined that the student has fallen behind or is likely to fall behind in their studies due to these circumstances.

This declaration will specify the date of the first meeting about the circumstances and all matters listed under (a) above. The student counsellor may also include comments, advice and arrangements for the student or for discussion with the study counsellor.

Some circumstances are confidential. If so, the student counsellor will discuss with the student what will be included in the declaration.

c. Discussion with study counsellor and adjustment to study plan

The student will show the Student Counsellor's Declaration to their study counsellor and discuss with the study counsellor the inability to keep up with their studies and any advice they have been given. The student will then adjust their study plan. The discussion and adjustment to the study plan will take place as soon as possible after the meeting with the student counsellor.

If the student involved is an international student, the study counsellor will also talk about the IND's progress requirements. See also Article 73. Procedure at the end of the academic year.

d. Request for special arrangement

Based on special circumstances, a student in possession of a Student Counsellor's Declaration or advice from the student counsellor, may request special arrangements at the Examination Board, the programme or the service organisation.

88. Confidentiality of personal circumstances

Everyone who is aware of a notification of personal circumstances:

- will handle the information in a confidential manner; and
- will use the information only as part of their duties and for the purpose of implementing the regulations in the Education Guide.

The student counsellor complies with the code of conduct for student counsellors and will give information to the programme only:

- within the scope of the student counsellor's role;
- within the parameters of the agreements the student counsellor made with the student about the confidentiality of the information.

8 PART 8. TESTS

Chapter 1. Content and administration of tests and publication of test standards

89. Connection to unit of study

The final qualifications or learning outcomes and the goals for each test are connected to the unit of study described in attachment "Description Units of Study and Tests", or to a module within that unit of study.

The project task or test questions will clearly and precisely state how students are expected to answer them.

90. Test duration

Students will be given sufficient time to complete the test, according to reasonable benchmarks.

91. Test standards

Test standards for practical work and group assignments are published prior to commencement of these assignments.

The test standards are published prior to publishing the test results.

Chapter 2. Types of tests

92. Types of tests

11 Appendix: Annual Programmes of the TER specifies the types of tests. There are three types of tests, which can be detailed in various ways:

1. Written
   Students answer test questions on paper or electronically, or they complete projects on paper or electronically.
2. Oral
   Students answer test questions in a meeting (online or physical) with one or more examiner(s).
3. Other
   For the test or project, students perform tasks that will be described clearly by the programme. Possibly a written, digital or oral component, or a combination of these, must also be completed.

If necessary, the type of test can be changed during the academic year, with due regard to the participation in the decision-making process. Students will be informed of this in a timely manner.

93. Oral tests

a. One student examined orally at a time.

In an oral test (online or physical), one student is examined at a time, unless the Examination Board decides otherwise or if testing is conducted in a different manner. If so, this will be announced before the start of the unit of study.

b. Examiners and public access

Oral tests are conducted by two examiners. This may not be the case if it is not feasible from an organisational point of view, or if the test is administered online. In that case, the oral test must be recorded.

This will not be the case for the parts of a degree programme. These will be administered by two examiners. An oral test is open to the public, because that ensures transparency and allows for monitoring of the conduct of the test. This does not apply if the Examination Board decides otherwise.

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c. Rules for conducting tests
Oral tests are conducted by two internal examiners, or by one internal and one external examiner. An external examiner is an independent expert from the professional field.

If an oral test (online or physical) is conducted by a single examiner, an audio or video recording is always made.

d. Protocol
For every oral test, a protocol will be drawn up. The examiners will sign the protocol. If an external examiner was involved in the test, he or she will also sign the protocol. The protocol will be preserved as specified in the university's regulations on retention periods.

If an audio recording of an oral test is made, it will be preserved as specified in the university's regulations on retention periods.

94. Other types of tests

Grounds
Disabled students can ask the Examination Board if they can complete tests in a way that accommodates their disability as much as possible. They can also request any additional or adapted materials they may need to be able to complete the test.

Students can also ask to complete tests in another form for other reasons. The Examination Board will only grant such requests in exceptional, individual cases.

Adjustments are possible only if they do not change the test goals or the level of the test.

Procedure
Students must request an alternative form of test by the start of term at the latest. They should submit their requests in writing to the Examination Board. The letter should set out the reasons for the request and enclose a copy of the advice received from the student counsellor (Click here for more information about advice from the student counsellor).

The Examination Board will make a decision as soon as possible, at any rate no later than fifteen working days after receiving the complete request.

Chapter 3. Timing and frequency of tests

95. Timing of tests
Each unit of study will, if possible, end with one or more tests in the term in which the teaching was delivered. If the teaching was delivered over a whole semester, the test will, if possible, take place in that semester.

If a unit of study is composed of modules, the modules will likewise be completed, if possible, within the term or semester in which the unit of study was delivered.

The year programme states when the tests take place.

96. Number of test opportunities per academic year
For all tests of the programme in the form or variant as followed by the student, they will have two test opportunities per academic year, within normal term time. There are a number of exceptions to this rule. If there is an exemption, this will be set out in Schedule 1 of this TER.

- There may be only one test opportunity per academic year for tests *after the first year*, for which no resit can be scheduled in the same academic year due to the nature of the study unit. This applies, for example, to work placements in the fourth term.
- For some tests, the programme may indicate that students will be given more than two opportunities to complete them.

- The programme may also indicate that it will offer only one test opportunity in each academic year.

In the second year programme, test opportunities are offered in each semester. This could mean that for some tests three opportunities are offered per year. However, students can only take two of these three test opportunities.

Chapter 4. Resits

97. Timing of resits

The final resit opportunity in the first year will be scheduled before the end of Term 4. This is due to the fact that study recommendations need to be issued in time.

For tests which form part of the curriculum from the second year onwards (see the proviso in Part 7), resits can also be scheduled before the start of the new academic year. in other words, in Term 5.

98. Resit when test passed at first opportunity

Students who have passed a test are not entitled to a resit.

However, a student may want to resit a test in an exceptional situation. In this case, they must submit a request to the Examination Board, which will make a decision within thirty working days. If the Examination Board grants the request, the highest result that the student achieves will apply.

99. Additional opportunity due to special circumstances

In exceptional cases, the Examination Board may decide to provide an additional test opportunity.

This will only occur if personal circumstances exist as described in Article 85. Definition of personal circumstances, or in other extremely exceptional cases.

Students must submit a request to the Examination Board and state the reasons for their request. The Examination Board will seek advice from the student counsellor, if the Board deems this to be necessary. The Examination Board will make a decision within fifteen working days.

The programme offers no extra resits after 1 July for students in their first year. This is because these students will receive their study reccomendation by 31 July 2024 at the latest.

100. Resits in the context of curriculum obsolescence and updating

Special rules apply to resits if a curriculum is obsolete or being updated. See Articles 21. Curriculum obsolescence and updating to 24. Evaluation of the programme.

Chapter 5. Bringing forward test opportunities

101. Bringing forward

An Examination Board may permit a student, on a one-off basis, to take one or more tests earlier, so that the student can pass the final examination without a disproportionate delay.

This is subject to the condition that bringing forward the test opportunity is reasonably possible.

If both test opportunities in the academic year have already passed, the student will be given a third test opportunity. The student must submit a request to the Examination Board and state the reasons for the request.

The Examination Board will make its decision within fifteen working days after receiving the complete request. The Examination Board deals with these requests with leniency.

102. Conditions for bringing forward test opportunities

For a test opportunity to be brought forward, the student must meet the following conditions:

1. They must have a maximum of 10 credits left to obtain for a 240 credits programme, or a maximum of 7 credits for a 180 credits programme before completing the final examination.
2. For the obtaining of the remaining credits, the student is not subject to any attendance requirement for classes, nor is there any obligation to execute group projects.
3. The student cannot attend any classes or complete any tests in the next term or terms, due to the university's timetabling. This is based on the four ordinary terms of the academic year.
4. The student has:

- attended the classes associated with the tests;
- taken the tests concerned; and
- tried to pass the tests with adequate preparation.

Students who have obtained at least 200 credits can also invoke this article in the Aerospace Engineering program to bring a test opportunity forward. The other conditions mentioned above remain unaffected.

Chapter 6. Time, place and duration of tests

103. Test timetable, testing room, materials

In the first two weeks of each term, the Service Point will publish the **test timetable** that the programme has set on Iris. If there are any changes to **testing rooms**, these will be announced at least two working days before the test date.

The programme arranges test dates so that they are spaced in an optimal way for students. The period of time in which a written of oral or test is taken is called a **test session**.

In the first two weeks of term, the examiner will publish a list of the **materials** that students may use in the test.

Students must also comply with:

- the rules concerning materials set out for the unit of study;
- the provisions regarding these rules in the test session instructions; and
- the instructions given by the Examination Board.

104. Deadline for submitting work

The test timetable will state the deadline for submitting work by the student other than in a test session. If this date is not stated in the test timetable, it will be announced in good time in another manner.

It will also be announced in advance what the consequences are if students do not submit work or do not submit it in a timely manner. This does not apply if this information is already included in attachment "Descriptions Units of Study and Tests".

105. Length of the test session

Written test

A written test session lasts a maximum of 180 minutes, unless the Examination Board has set a longer timeframe for a particular student.

Oral test

An individual oral test session will last a minimum of 15 and a maximum of 60 minutes. This does not apply if the nature of the test session makes a longer timeframe necessary. attachment "Descriptions Units of Study and Tests"indicates the length of each test session. If necessary, it also states the reason for the length of a particular test session.

Chapter 7. Special test arrangements

106. Language deficiency

A student with a language deficiency who is following a Dutch-language programme can submit a request to the examination board for extra examination time and/or permission to use a dictionary during examinations. The examination committee can extend the test session by a maximum of 25% or 30 minutes. Tests lasting 60 minutes or less can be extended by a maximum of 15 minutes. More information about this is given in Chapter 2 of the Education Guide.

107. Disability

The Examination Board may decide to extend a test session for students with a disability by up to 60 minutes. They may also offer students additional auxiliary materials, or they may do both. Students must personally submit a request to this effect. Before the student submit a request, the student counselor must be asked for advice. The student counselor may draw up an advice per request by the student. The advice will be sent to the Examination Board. More information about the student counsellor can be found here.

108. Alternative test time or location

In very exceptional circumstances, the Examination Board may allow students to sit a test at another time or in another location. A disability is an example of exceptional circumstances.

109. Submitting a request for special arrangements

Students must submit their requests for special arrangements in writing to the Examination Board at the start of term. If the exceptional situation does not arise until later, students must submit their request as soon as possible after the situation arises. Ideally, the Examination Board would then put the special arrangements in place for the current term. If that is not possible because a student has submitted their request too late, the Examination Board will put the special arrangements in place for the next term.

In their letters, students must explain the reasons for their request.

If a student has a disability, they must include an electronic or written opinion from the student counsellor. If the student counsellor has accepted a statement from an external expert, the student counsellor must state this in the opinion.

The Examination Board will inform students of its decision in writing at the latest within fifteen working days after the submission of a complete request.

Chapter 8. Registering for tests

110. Which tests to register for

Students must register for tests each term within the designated registration period. Registration is necessary for:

- written test sessions; and
- tests for which students must submit work that will be submitted and assessed via the digital environment. This does not apply to situations where the programme does this on behalf of the students.

111. What happens if students do not register in time

Students who fail to register in time can still register at the Service Point in the week following the registration period. They will then be entered through the Service Point.

Without registration, students cannot participate. If students failed to register due to circumstances beyond their control, they must submit a request to the Examination Board as soon as possible, seeking permission to participate. Such requests must be in writing and must explain the reasons for the request.

The Examination Board will inform students of its decision in writing at the latest within fifteen working days after the submission of a complete request.

112. Identical tests

If students are enrolled for more than one programme at the university, and these programmes offer the same test, the registration will apply to both programmes. However, there will still be only two test opportunities per year. The result will be recorded under both programmes.

113. Confirmation of registration

Students will receive confirmation of registration. Such confirmation does not always mean that students may participate. They may participate only if they meet all of the conditions for taking part in the test. These include both the general conditions in this TER and the conditions set out in attachment "Descriptions Units of Study and Tests".

Chapter 9. Participation and attendance requirement

114. Participation in group work

Students are required to actively participate in group work.

If a lecturer notices that a student is not cooperating and does not see any improvement despite encouraging the student to cooperate, the lecturer may tell the student that they can no longer participate in the unit of study or module. The lecturer must then report the student to the Examination Board as soon as possible. The Examination Board will make an official decision about whether the student may continue to take part in the unit of study or module.

Before the Examination Board makes its decision, it will give the student an opportunity to tell their side of the story. A report of this meeting will be drawn up.

If the teaching group, tutorial group or lecturer in question has not made sufficient effort to ensure that the student cooperates, the Examination Board can decide that the student may continue to participate. The Examination Board will make a decision within thirty working days.

115. Attendance, active participation and/or preparation requirements

If it is a requirement for a unit of study that students be present, actively participate and prepare in advance, the Examination Board may decide, on a proposal from the lecturer concerned, that a student may no longer participate. This may happen only if this is included in the description for the unit of study in the attachment "Descriptions Units of Study and Tests".

Before the Examination Board makes its decision, it will give the student an opportunity to tell their side of the story. A report of this meeting will be drawn up.

In exceptional cases, the Examination Board may determine that students are not required to be present for all or for certain classes or are not required to prepare all or part of the work. If so, it will set substitute requirements for these students. In such cases, students must submit a request to the Examination Board, which will make a decision within thirty working days.

116. Consequences of a decision to exclude

A decision by the Examination Board to exclude a student will prevent the student from participating in the next test for the unit of study in question, unless a different penalty is specified in the unit of study description.

Chapter 10. Assessment

117. Examiner(s)

Every test will be graded by one or more examiners. The Examination Board determines who the examiners will be.

If a test is graded by more than one examiner, the Examination Board will designate one to be the primarily responsible examiner. The primarily responsible examiner consults with the other examiner(s) to decide on the grades and associated feedback. The primarily responsible examiner then communicates the grades and feedback to the students. This is always the case when grading units of study that are part of a graduation programme or of a component of a graduation programme.

118. Grading procedure

The examiner grades the work against the test standards published in writing prior to the test. Students have passed a test if the examiner determines that their written or oral work meets the requirements.

119. Grading transparency

Students must be able to see from the test standards and the grading procedure how their results were determined.

120. Assessing work placements and graduation products

The procedure for assessing work placements and the graduation programme parts will be documented in writing in a test protocol, together with the associated test forms.

Assessment of a unit of study that is part of a graduation programme or of a component thereof will be done by at least two examiners, unless the attachment "Descriptions Units of Study and Tests" states otherwise. The Examination Board may appoint an internal supervisor as an examiner, but not as the primarily responsible examiner.

The examiner, or where there are multiple examiners, the primarily responsible examiner, is responsible for the final grade awarded for the work placement and for the unit of study that is part of the graduation programme or a part thereof.

When assessing the work, the opinion of an external supervisor serves as advice to the examiner.

121. Assessing the vocational component of dual-form programmes and work placements

For dual-form programmes, the test protocol is appended to the work-study agreement so that the vocational component can be assessed. For work placements, the test protocol is appended to the work placement contract. The appendix contains the feedback and the opinion of the trainee supervisor on the student's performance. The trainee supervisor signs this document and sends it to the examiner.

The opinion of the trainee supervisor serves as guidance for the examiner who is responsible for the test.

Chapter 11. Grades and grading scales

122. Grading in points

Tests are graded on a grading scale from 10–100.

Students have passed if they obtain a grade of 55 points or more.

If the grade is less than 10 points, it will be recorded as a grade of 10.

123. Grading in letters

A. Grading a test with either 'Pass' or 'Fail'

For reasons relating to programme content, a test may be given a grade of either 'Pass' or 'Fail'.

B. Grading a test with Advanced performance/Expected performance/Below expected performance.

For reasons relating to programme content, a test may be given a grade of above average, average or below average.

124. Submitting a blank test paper

If students submit a blank test paper, they will receive a grade of 10, or an F (Fail) in the case of a unit of study or module in which no grades are awarded.

125. Failure to participate in a test opportunity

If students do not participate in a test opportunity that applies to them, no result will be recorded in the academic monitoring system; however, they are considered to have used the test opportunity.

The same applies if students fail to register or cancel their registration.

Deregistering for a test by students is appreciated because it is helpful for organisational reasons to know who will be participating. But if a student doesn't register, this will have no effect on the number of test opportunities remaining to them.

In the second year programme, test opportunities are offered in each semester. This could mean that for some tests three opportunities are offered per year. However, students can only take two of these three test opportunities.

126. Converting grades obtained at other universities

If a grade from another university is expressed using a different scale from the one applied by Inholland, the grade will be converted to one based on the scale from 10–100. The Examination Board will make rules for this procedure and appoint an examiner to convert the grade.

If the grade is obtained at an international university, a Pass (V) or Fail (O) will be listed instead of a grade. When a student is eligible for a designation as described in article 181. 'With merit' of 182. 'Cum laude' or when they need a certain average grade for further education, the student can request the Examination Board to convert the result from the international university into a grade.

The Examination Board will make a decision within fifteen working days.

When the grade is obtained at a partner university of which the converting scales are known, we use that scales.

127. Grade for a unit of study

The grade for a unit of study is the weighted average of the grades for the modules and tests in the unit of study, based on the ratio of the weights of the modules and tests as defined in Schedule 1 of this TER.

The main rule when awarding a grade for a unit of study is that students must pass all interim tests (obtaining 55 points or more) in order to be deemed to have passed the unit of study. This means that it is not possible to compensate for failed tests within a unit of study.

Units of study for which Schedule 1 of this TER states that compensation is possible are an exception to this rule. In that case, the rules that apply to compensation will be indicated for the unit of study. The final grade for a unit of study must, unrounded, always be at least 55 points.

128. Final assessment

Students must pass every unit of study.

The grade for each unit of study (see Article 127. Grade for a unit of study) is converted into a final grade on a grading scale from 1–10. This final grade is stated in the list of grades attached to the degree certificate. Final grades will be rounded off to the nearest whole number, as is customary in the Netherlands.

For a limited number of units of study, the final grade may be expressed as either a 'Pass' or a 'Fail'. That will be the case if it is impossible to express the grade as a grade, as this is fitting for the study programme.

However, only a very limited number of units of study can have a final grade of 'Pass' or 'Fail'. If students have too many units of study with exemptions or 'Pass' grades, they will be unable to achieve a 'with merit' or 'cum laude' designation. For more information about "with merit" and "cum laude" designations, see Articles 181. 'With merit' and 182. 'Cum laude'.

Chapter 12. Test results

129. Timeframe for issuing results for oral tests and practical assignments

The examiner determines the test results of oral tests and practical assignments after they have been completed. If possible, the

examiner will let students know the approximate result immediately after the test.
Students receive their final results no later than ten working days after the test via the PeopleSoft academic monitoring system.

130. Timeframe for issuing results for written tests

Students receive their final results via the Peoplesoft academic monitoring system no later than fifteen working days after the test date or the final submission deadline of the test.

131. Timeframe for issuing results for special written tests

For some types of written tests, students receive their final results via the PeopleSoft academic monitoring system no later than twenty working days after the test date or final submission deadline of the test. These types of tests include research reports, work placement reports and theses. If these timeframes apply, this will be indicated under the details of the type of test in the unit of study description in the attachment "Description Units of Study and Tests".

132. Alternative timeframes

The Examination Board can change the grading timeframes set out in Articles 129, 130 and 131. If they do so, they must state their reasons. The Examination Board will ensure that timeframes in respect of tests that are important for binding study recommendations are such that the recommendations can be issued on time. If timeframes are extended, students will be notified immediately.

133. Notification of results

Students will receive a message that their results have been recorded in the PeopleSoft academic monitoring system. They can make a copy of their results as evidence.

The message will advise students of their right to access their test work. See also Article 149. Right of access The message will also tell students that they may appeal to the Examination Appeals Board via the digital Complaints and Disputes portal on Iris.

134. Reviewing results

If it becomes apparent, after a report from a student or during follow-up discussion of the test, that a grade is incorrect, the examiner can change the result. The provisions that applied when the examiner determined the first result also apply here.

135. Correction of grades

If the result in the academic monitoring system is not the same as the result previously communicated by the examiner, the student concerned can ask the examiner to change the result. The student must do so within four weeks of the date on which the result was entered in the academic monitoring system. He must submit documents to substantiate the request.

The student may appeal the examiner’s decision not to change the result. The appeal should be submitted within six weeks to the Examination Appeals Board via the digital Complaints and Disputes portal on Iris.

136. Submission and retention of work, misplaced work

For every test, the examiner or an invigilator will establish that students are present and have submitted work by recording the fact on the attendance list.

Students should ensure that they keep a digital or physical copy of all submitted work outside a test session.

If the examiner is unable to determine a result because the work has been misplaced, the examiner will notify the Examination Board.

The student will have to take the test again. If necessary, the Examination Board can allow the student an additional test opportunity to do so.

The Examination Board will make a decision within thirty working days.

Chapter 13. Irregularities, fraud and plagiarism

137. Rules relating to tests

The rules that apply to the completion of test sessions can be found:

- in the instructions for test sessions; and
- attachment "Description Units of Study and Tests".

The Examination Board may set additional rules. If so, these rules will be published within the first two weeks after the start of the term. They will also appear on the test cover sheet.

The instructions deal with written test sessions but apply by analogy to other forms of tests.

In all tests, students must comply with these rules and with the instructions given by the invigilator, the examiner or the Examination Board.

138. Irregularities

If something happens during the test process that is not in compliance with the rules as set out in the TER, the regulations or the instructions for test sessions, this is referred to as an irregularity. An irregularity *may* also be fraud or plagiarism, but this is not always the case.

Irregularities may result in a warning being issued. If there is another irregularity after the warning has been issued, it may be decided to declare the test invalid.

As a result of irregularities, it may be determined that the test is invalid for one student, for all students who took part, or for a group of students who took part, even if they were not to blame for the irregularity. This decision will be made if it is no longer possible to conduct an accurate assessment of knowledge, understanding, skills or professional attitude. See also Articles 144. Grounds for a declaration of invalidity and 145. Consequences of a declaration of invalidity.

139. Disturbance

If a student causes a disturbance during a test to the extent that it affects other students sitting the test, the invigilator may ask the student to leave the testing room. The invigilator will make a note in the protocol. The Examination Board will decide as soon as possible whether the invigilator did the right thing in asking the student to leave. In doing so, it will follow the procedure set out in Article 142.

If the student refuses to leave the testing room, the invigilator may decide to allow the student to remain to prevent additional commotion that could affect the other students. In this situation, the invigilator will not give the student's work to the examiner but will instead give it to the Examination Board. The invigilator will make a note of the event in the protocol.

The Examination Board will make a decision in the same manner as if the student had actually left the room. If the Examination Board decides that the request to the student to leave was not justified, the examiner will grade the student's work.

If the Examination Board decides that the student's removal was justified, this is considered to be the same as if the student had submitted a blank test paper. The student will be given a grade of 10 (on the grading scale from 10–100) or F (Fail).

If the Examination Board decides that the student's removal was not justified, the student may sit the test again. The Examination Board will decide when and how that will happen.

140. Fraud/serious fraud

1. Fraud is an act or omission by a student that makes it wholly or partially impossible to conduct an accurate assessment of their knowledge, understanding, skills or professional attitude. Examples of fraud include, but are not limited to, events when a student:

a. uses materials during the test that they are not permitted to use;

b. cheats during a test;

c. gives information about a test to other people or receives such information, either inside or outside the testing room;

d. makes up and/or falsifies survey or interview answers or research data;

e. uses or reproduces another person's texts, reasoning, data or ideas without fully and correctly referencing the source (plagiarism).

2. Serious fraud includes, but is not limited to, events when a student:

f. falsifies tests, for example by making changes to work after being granted an opportunity to view it;

g. doing the test (or allowing it to be done) wholly or partially by or for another;

h. falsifying and/or forging a signature;

i. if the abovementioned under 1.d. and 1.e. occurs in a section of the graduation programme.

Repeated fraud may be designated as serious fraud.

141. Participating in fraud

Participating in fraud is also deemed to constitute fraud. Participating in fraud includes, but is not limited to:

- allowing students to cheat;
- giving information to or receiving information from another person during a test;
- giving someone the questions, tasks or model answers before or during a test;
- sitting a test or completing all or part of an assignment in another person's name.

This list of participating in fraud is not exhaustive.

142. Procedure in the event of irregularities and suspected fraud

Report to the Examination Board

If an invigilator or examiner notices irregularities or suspects fraud before, during or after a test – while grading, for example – they will note it in the protocol that is drawn up for each test.

Student rights and obligations

Students may be asked to submit all the documents, data or items that may have played a role in the – suspected - fraud. If a student refuses to do so, this will be noted in the protocol.

Students may have their comments regarding the event recorded in the protocol. In that event, they may sign the protocol, but they are not required to do so.

The invigilator or examiner will give the Examination Board:

- the protocol;
- supporting documents, if any; and
- the work completed by the student, if necessary.

Postponement of grading

If irregularities or suspected fraud are uncovered before the work is graded, the work of the student involved will not be graded until the Examination Board has made a decision.

Meeting

Before the Examination Board makes a decision, the student may tell their side of the story. A report of this meeting will be drawn up. Before the Executive Board makes a decision on a proposal to deregister the student, the student may tell their side of the story. A report of this meeting will be drawn up.

1. *Decision-making*

The Examination Board will make a decision within 30 working days about whether fraud has occurred, based on:

- the written documents; and
- what the student said during the meeting.

If fraud is found to have occurred, the Examination Board will determine whether it was serious fraud.

The Examination Board will then decide on the measures to be taken. The possible measures are set out in Article 143.

143. Measures in the event of fraud

Measures in the event of fraud
If fraud has occurred, the Examination Board will take measures that are appropriate to the fraud.

These measures are exclusively the following:

- The Examination Board confirms the measures taken by the examiner or invigilator.
- The student receives a written warning.
- The Examination Board declares the student's test invalid. In that case, the work will not be graded. If the work has already been graded, no grade will be entered in the PeopleSoft academic monitoring system. If there is already a grade in the system, it will be removed. In both cases, the letters ME (Measures of the Examination Board) will be entered.
- The Examination Board decides that the student may not take part in the next opportunity for the same test.
- The Examination Board decides that the student may not take part in any tests for a period determined by the Examination Board. That period will not exceed one year.

Measures in the event of serious fraud
In the event of serious or repeated fraud, the Examination Board may recommend to the Executive Board that the student's enrolment in the programme be terminated. The Examination Board will consult the faculty director first.

Chapter 14. Declaring results to be invalid

144. Grounds for a declaration of invalidity

The Examination Board may determine that a result is invalid if, after the result was announced, it was found that any of the following had occurred:

- an irregularity that made an accurate assessment impossible, even if the student(s) were not to blame for the irregularity;
- fraud;
- a ruling by an appeal body.

The Examination Board will make a decision within 30 working days after becoming aware of any of the above circumstances.

145. Consequences of a declaration of invalidity

If a result is declared to be invalid, the grade recorded for the student(s) concerned will be replaced with ME (Measure Examination Board). The Examination Board will inform the student(s) of its decision in writing, also informing them of their right of appeal.

If the work is to be re-graded and a new result determined, the Examination Board will instruct an examiner to do so. The new result will be recorded in place of the result that was removed.

Chapter 15. Validity period of completed tests and obtained exemptions

146. Limited validity period for tests and exemptions

A test result has a limited validity period if the following two conditions both apply:

- The test result has an expiry date, which is indicated in Article 23. Expiry date, transition period and validity period of this TER;
- and the knowledge, understanding or skills being assessed are demonstrably obsolete.

There are no education and test results with an expiry date for the programme.

147. End of validity period

The validity period for an obsolete test result with an expiry date will end:

- for the foundation phase: three years after the first enrolment;
- for an accelerated programme: two years and eight months after the first enrolment;
- for the main phase of the Bachelor's programme: five years after the first enrolment for the main phase. If the student has an exemption for the foundation phase: five years after the first enrolment.

148. End of validity period

a. Extension and special circumstances

The Examination Board may extend the validity period for students:

- with special circumstances, as described in the Profile Fund (see Chapter 3 of this Education Guide);
- and for whom the validity period in Article 147 is too short.

They do not have to comply with the other conditions in Article 85. Definition of personal circumstances.

The Examination Board will ask the student counsellor for advice about:

- whether the special circumstances fall within the scheme; and
- how much of a delay the special circumstances have caused to the student's studies.

b. Extension in other circumstances

If there are any special circumstances other than those referred to above under a), and in the opinion of the Examination Board they have caused a delay in a student's studies that is not adequately compensated for by the validity period for the tests, the Examination Board may extend the validity period. The student in question must submit a request to that effect to the Examination Board.

The student may submit a new request if new special circumstances arise or the circumstances continue.

For the reporting of a study completion delay due to special circumstances and the resulting further activities, the procedure in Article 87. Procedure for establishing special and personal circumstances applies. This is not the case if that procedure already applies based on other rules in the Education Guide.

Students must submit the extension request:

- electronically;
- stating reasons why they are asking for an extension;
- and before the validity period expires.

Where a student submits a request late but has a good reason for doing so, the Examination Board will still accept the request for handling.

The Examination Board will make its decision within 30 working days after the complete request is submitted.

Chapter 16. Accessing, discussing and requesting copies of tests

149. Right of access

Students are entitled to view and discuss their graded work. They can do so at the latest up to four weeks after notification of the

result of a written test via the PeopleSoft academic monitoring system.

Programmes determine when and where students can view and discuss their work. This may also take place digitally. When they view their work, students can also see the test standards that were used.

The Examination Board may instruct students how to view their work, for example to prevent students from disseminating test material.

150. Right to obtain a copy in the event of a dispute

If a student and an examiner disagree on a result, a copy of the work (or relevant part thereof) which they disagree on will be created, free of charge. The student needs this copy in order to lodge an appeal. The student must request the copy personally.

Chapter 17. Retention of tests

151. Original retained by the university

The university will always keep the original of important written documents, such as important essays, work placement reports, research reports, theses and components of graduation programmes.

152. Retention period

The university will retain these documents, as well as final research projects, examinations and assignments that students have produced in this respect for a minimum of seven years. They may be kept in electronic or hard copy format. The university will retain these documents for longer if that is stated in the university's regulations governing retention periods.

The university will retain other student work and recordings of oral tests which are not covered by the above list of documents for two years. This is in accordance with the university's regulations governing retention periods.

153. Inclusion in university records to comply with statutory obligations

A copy of the documents referred to in Articles 151 and 152 will be kept in a file or archive to be used for the work of the university. This will be done only if the documents are deemed to be suitable for this purpose. The documents are necessary in order to comply with statutory obligations, such as a visit/accreditation. They may be consulted if that is in line with the university's objectives.

The same applies to inclusion in the HBO Knowledge Base: www.hbo-kennisbank.nl.

If the documents contain confidential information or if third parties have rights to the work, this will be respected. However, a work as a whole cannot be regarded as confidential.

154. Keeping and retaining a (digital) portfolio

The programme does not work with a (digital) portfolio.

Chapter 18. Exemptions

155. Exemptions from tests

The Examination Board may decide that a student does not have to complete any tests for a particular unit of study or a module. This is called an 'exemption'.

156. Unit of study exemptions

Students will be given an exemption for a unit of study if they have been granted exemptions for all tests in that unit of study.

157. Exemptions after switching programmes within the university

If students switch to another programme within the university, they can take their test results and exemptions with them only if

they have applied for exemptions in this respect. The same applies to any results students have previously obtained in study programmes at the university that are not government-funded.

158. Exemption criteria

Students may be granted exemptions if they:

- have previously passed tests and examinations within the higher education system;
- have demonstrably acquired knowledge and skills outside of the higher education system which are approximately the same as the unit of study/module and associated test(s) in terms of:
    - content;
    - level;
    - required final qualifications.

If a student requests an exemption based on tests completed in a foreign institution, the Examination Board will consider the quality of the institution in its decision. The evaluation of quality will be based on a previous investigation by the university or on the Examination Board's own investigation.

159. Exemptions granted solely based on up-to-date knowledge and experience

The Examination Board will grant exemptions only based on up-to-date knowledge and experience.

Generally, the Examination Board applies a period of five years when considering what 'up to date' is. In other words, the tests or examinations must have been completed no more than five years before the date of the exemption application. The same applies to knowledge and skills acquired outside of the higher education system.

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160. Exemptions procedure and evidence

Requests for exemptions must be submitted to the Examination Board in writing (or by email). Students must explain the reasons why they are asking for an exemption and enclose supporting documents.

The Examination Board may ask a student to provide further information or additional documents. It may also request any information it deems to be necessary in order to make a decision.

Supporting documents may include:

- copies of certificates bearing the stamp of the relevant organisation;
- transcripts showing tests and examinations, or certificates; the student must provide a full description of study or degree programmes or relevant components thereof. The same applies to results previously achieved as a contract student in the same programme at the university;
- copies of theses, articles, reports or coursework that:
    - have been written by the student; and
    - have been assessed and certified by an authorised body;
- a stamped copy of an APL report issued in accordance with the APL Quality Code by an accredited APL provider. The report must clearly show that the student has the knowledge and skills required for the requested exemption; the student must also provide the associated documents if the Examination Board asks for them.

The Examination Board will make a decision on a complete exemption application within 30 working days. The Examination Board may extend this timeframe once, by a maximum of 30 working days.

161. Further investigation

If the Examination Board determines, on the basis of an investigation, that a student cannot be granted an exemption for all tests in a unit of study, the Examination Board may decide to grant an exemption following a further investigation. This investigation involves a comparison by the Examination Board of the final qualifications that the student is lacking against the content of the unit of study.

The investigation may entail that the student must pass an ordinary test.

In its decision, the Examination Board will set a deadline by which the further investigation must be successfully completed.

If a student sits tests which are covered by the exemption, it will be assumed that they did so in the context of this investigation. If the student fails the test, they will not be granted an exemption for all the tests.

The Examination Board may determine that the validity of a result will end earlier than the date resulting from the general exemptions policy (see Articles 146. Limited validity period for tests and exemptions t/m 148). The Examination Board may do so when:

- the student's request relates to an exemption they previously received for another programme at the university;
- or the programme is being updated.

162. Waiving further investigation

If the Examination Board decides that a component of a test is not essential in terms of the conditions as specified in the unit of study description regarding the acquisition of the knowledge, understanding and skills required to obtain the degree, it may decide not to conduct an investigation into that component. This may only occur in an exceptional case, such as disability or religious belief. It also depends on the reasons given by the student.

163. Exemptions prior to enrolment

The Examination Board may also decide to grant an exemption before a student is enrolled. In that case, the student will receive the exemption only once they have actually enrolled.

164. Exemption from foundation examination

If a student has obtained an exemption for all foundation phase tests, he is deemed to be exempt from the foundation examination, unless the Examination Board has conducted its own investigation as described in Article 173. Examination Board investigation.

In that case, the student will not receive a foundation certificate.

165. No exemption from final examination

Students can only obtain a limited number of exemptions for the final examination of a Bachelor's programme.

For this final examination, students must obtain a minimum of 60 credits by successfully completing tests. This includes units of study connected with a graduation programme or part thereof. In the case of an accelerated pre-university education pathway, this will be a minimum of 45 credits. This includes units of study connected with a graduation programme or part thereof.

166. Recording exemptions

If an exemption is granted for a test, the word 'vrijstelling' (exemption), or the abbreviation 'VR', will be recorded in place of the test result in the PeopleSoft academic monitoring system. This will be based on the date on which the student is notified of the decision. If this date is prior to the date of enrolment, the date of enrolment will be used.

Chapter 19. Unit of study substitution; national and international mobility

167. Request for substitution

Students may request the Examination Board to let them substitute one or more of the units of study which they still need to complete, along with the associated tests, with units of study and associated tests from another programme offered by the university or by another Dutch or foreign institution of higher education. Students must explain the reasons for their request. This is subject to the condition that students still meet the requirements of the examination, and that the study load in credits must remain the same.

The Examination Board will make its decision within 30 working days after the complete request is submitted.

168. No request required

Students do not need to submit a request if there is a partnership agreement between the university and another institution in the Netherlands or abroad.

169. Rules for teaching and testing in the case of a substitution

Any classes taken and tests completed at other institutions will be subject to the rules for teaching and testing of that institution. This does not apply if the Examination Board decides otherwise in this respect.

170. Other conditions

The Examination Board may impose other conditions on the substitution of units of study and the associated tests. The substitution of units of study and associated tests with those of a foreign institution is subject to the condition that the quality of the foreign institution can be established by the Examination Board, based on:

- a previous investigation by the university;
- or the Examination Board's own investigation.

The Examination Board may also seek advice from Nuffic (the Dutch organisation for internationalisation in education).

9 PART 9. EXAMINATIONS, DEGREE CERTIFICATES AND TRANSCRIPTS

Chapter 1. Examinations

171. Foundation and final examination

The programme includes both a foundation examination and a final examination.

172. Requirements for passing the examination

Students have passed the foundation examination if:

- they have passed the tests for all units of study that are part of the foundation phase of the programme;
- and the validity period of those tests has not expired.

This does not apply if the Examination Board decides to conduct its own investigation, as described in Article 173.

Students have passed the final examination if:

- they have passed the tests for all units of study that are part of the main phase of the programme;
- and the validity period of those tests has not expired.

This does not apply if the Examination Board decides to conduct its own investigation, as described in Article 173.

173. Examination Board investigation

The Examination Board may decide that the examination, in addition to the tests in the programme, will include an investigation conducted by the Examination Board itself into students' knowledge, understanding and research.

This investigation is more or less the same as a test.

The Examination Board of the programme does not conduct its own investigation.

174. Requirements for passing the examination

In exceptional cases, the Examination Board may decide that students do not have to pass every part of a test in order to be deemed to have passed the examination. The Examination Board may set conditions for such a decision. Examples of exceptional cases are a disability or religious belief.

The Examination Board may make such a decision if it considers that a component of a test is not essential in terms of the requirements specified in the unit of study description for acquiring the knowledge, understanding and skills required to obtain the degree.

The Examination Board will then determine the final grade for the unit of study in a fair and reasonable manner, as much as possible in accordance with the rules set out in the TER. In doing so, the Examination Board will not give any consideration to the component in question.

Chapter 2. Degree certificates and transcripts

175. Degree certificate

The Examination Board awards a degree certificate to students as proof that they have passed their final examination.

The Examination Board may decide to award the degree certificate only if the Central Student Administration declares that the student has paid all amounts due and payable by the student.

The degree certificate states the date on which the student is deemed to have passed the final examination. This is the date on which the student completed his/her last test. If the Examination Board has conducted its own investigation as described in Article 173, then the date on the certificate will be the date of the investigation.

The certificate will also state the name of the degree that has been awarded by the Executive Board.

The Examination Board awards degree certificates within five to eight weeks after students pass the final examination. The student will receive a notification with a request to check the data that will be displayed on the degree certificate. The Examination Board will then invite the student for the ceremony in which the certificate is awarded. If an Examination Board does not take the initiative to award a student's degree certificate, the student must request the Examination Board to award the certificate.

176. List of grades and diploma supplement

The Examination Board provides a list of grades with the degree certificate and also encloses a diploma supplement, except in the case of the foundation certificate.

177. Deferral of awarding of the degree certificate

If a student is entitled to receive a degree certificate but wishes to wait because it would be more advantageous to do so, and if the advantage the student would obtain is reasonable, then the student may request a deferral from the Examination Board using the designated form. On the form, the student should explain why the deferral is important to him and how long he wants to wait.

This is usually so that the student can complete an additional unit of study and have it included in the list of grades as an extracurricular unit of study, and not for the purpose of completing a second study programme. Deferrals are generally for no longer than six months. In any event, it is a condition of a deferral that the student not interrupt their enrolment. Note: deferrals can have consequences, for example for the student travel product. This should be checked with the Education Executive Agency (DUO).

178. Transcript

If a student has passed more than one test and the Examination Board does not award a degree certificate to the student, the student will receive a transcript from the Examination Board upon his request. At a minimum, the transcript will specify:

- the units of study for which the student passed the tests;
- the number of credits for those units of study;
- when the student passed the tests.

Chapter 3. With merit and cum laude designations

179. Recording on the degree certificate

The Examination Board may record a 'with merit' or 'cum laude' designation on the degree certificate for each examination for which a positive result has been achieved.

For the final examination, the Examination Board only counts the results from the main phase.

Awarding a designation is not in keeping with the programme's educational vision. For that reason, we do not issue designations and articles 180, 181 and 182 do not apply.

180. Basis of calculation

In performing the calculation, the Examination Board will use the final grades before rounding off for the units of study of the examination.

If a unit of study has several tests, this concerns the final grade before rounding off for that unit of study based on the calculation

of the average in accordance with Articles 127. Grade for a unit of study and 128. Final assessment.

In addition, the student must not have been studying for a longer period than the study duration as scheduled by the university. This does not apply if the longer study duration is due to personal circumstances or other special circumstances. The Examination Board will determine whether this is the case.

181. 'With merit'

The designation of 'with merit' will be recorded on the degree certificate if:

- a maximum of 30% of the total number of ECs with a word assessment is assessed. Word assessments are disregarded in the weighting.

- the weighted average final grade for all units of study is 7.0 or more;

- of these final grades, no grade is less than 6.5 before rounding off; and

- the student has received no more than 15 credits' worth of exemptions in the case of a 240 credits programme, or 11 credits in the case of a 180 credits programme.

In calculating the weighted average final grade, the Examination Board will not take into account the results for units of study that were awarded a 'Pass' or 'Fail' grade. A student can request the Examination Board to calculate the result from a foreign institution into a grade, so the grade can be taken into account for the weighted average final grade.

If a student has received more than 15 credits' worth of exemptions in the case of a 240 credits programme, or 11 credits in the case of a 180 credits programme, they may still obtain the 'with merit' designation if:

- the actual duration of the student's studies was correspondingly shorter due to these exemptions; and

- the number of credits for the final examination which the student achieved through tests, amounts to at least half of the total number of credits for that examination.

182. 'Cum laude'

The designation 'cum laude' is recorded as:

- the weighted average final grade for all units of study is 8.0 or more;

- of these final grades, no grade is less than 7.0 before rounding off; and

- the student has received no more than 15 credits' worth of exemptions (in the case of an accelerated pre-university pathway, 11 credits).

- For the foundation year, the student may not have obtained more than 5 credits of exemption (max. 4 credits for a fast-track programme of 45 credits).In calculating the weighted average final grade, the Examination Board will not take into account the results for units of study that were awarded a 'Pass' or 'Fail' grade. At the student's request, the examination board may convert results obtained at a foreign institution into a grade so that this result can be taken into account.

If a student has received more than 15 credits' worth of exemptions in the case of a 240 credits programme, or 11 credits in the case of a 180 credits programme: 11 credits)? The student may still be awarded the 'cum laude' designation if:

- the actual duration of the student's studies was correspondingly shorter due to these exemptions; and

- the number of credits for the final examination which the student achieved through tests, amounts to at least half of the total number of credits for that examination.

Moreover, for the final examination the final grade before rounding off for the units of study that form part of the graduation programme must be at least 8.0. The Annual Programme of this TER sets out which unit of study will be the determining factor for the designation 'cum laude'.

10 PART 10. FINAL AND TRANSITIONAL PROVISIONS

183. Updating the TER

The TER will not be changed during the academic year, unless the interests of students will not be adversely affected by the change.

184. Unforeseen circumstances

In any situations not provided for by the TER, a decision will be made by:

- the Executive Board, if the situation concerns general provisions;
- the faculty director responsible for the programme, if the situation concerns programme-specific provisions.

When implementing the TER, if staff members cannot agree on who has authority in a particular situation, the Executive Board will designate the competent body.

185. Publication, entry into force and authentic version

This TER forms part of the Education Guide of the university as referred to in Section 7.59 of the WHW

The Executive Board may extend the period of validity of general provisions of the TER. This can only be done for an entire academic year. The representative advisory council must give consent for the extension.

The faculty director can extend the period of validity of the programme-specific information. This can only be done for an entire academic year. The representative advisory council must give consent for the extension.

In the event of a discrepancy or difference of interpretation of the provisions of the TER, the text of the Dutch version will take priority over any version in another language.

11 Appendix: Annual Programmes

Programme: **Luchtvaarttechnologie** Faculty: **Engineering, Design, Computing** Mode of study: **voltijd**

Overview units of study

Legend

AF	Graduation part
PR	Graduation part designation
KE	Qualitative requirement (BSR)
BD	Professional component
OP	Optional professional or educational component
EW	Requirements for the job
KZ	Choice whether there are requirements for the job
C	Compensation within the unit of study

Academic year 1

Unit of study	Code	Term	ECTS	Specific details
Basic curriculum				
Introduction Aeronautical Engineering	1616LTP01Z	■□ □□	3	
Mathematics 1	1612LTP03Z	■□ □□	3	
Statics 1	1616LTP04Z	■□ □□	3	
Project 1.1	1621LTP27Z	■□ □□	6	
Mathematics 2	1612LTP06Z	□■ □□	3	
Statics 2	1621LTP07Z	□■ □□	3	
Materials 1	1622LTP08Z	□■ □□	2	
CAD 1	1618LTP09Z	□■ □□	1	
Project 1.2	1621LTP28Z	□■ □□	6	
Mathematics 3	1612LTP12Z	□□ ■□	3	
Mechanics of Materials 1	1615LTP13Z	□□ ■□	2	
Aerodynamics 1	1622LTP18Z	□□ ■□	3	

Unit of study	Code	Term	ECTS	Specific details
Manufacturing 1	1621LTP22Z	■■■■	1	
Project 1.3	1621LTP29Z	■■■■	6	
Dynamics 1	1615LTP17Z	■■■■	3	
Systems and Electronics 1	1616LTP21Z	■■■■	3	
Programming 1	1616LTP23Z	■■■■	3	
Project 1.4	1621LTP30Z	■■■■	6	

Academic year 2

Unit of study	Code	Term	ECTS	Specific details
Basic curriculum				
Linear Algebra	1621LTK01Z	■■■■	2	
Mechanics of Materials 2	1621LTK02Z	■■■■	3	
Aircraft Structures 1	1616LTK10Z	■■■■	2	
Composites 1	1621LTK05Z	■■■■	2	
Differential Equations	1621LTK08Z	■■■■	3	
Manufacturing 2	1612LTK03Z	■■■■	2	
Statistics	1617LTK17Z	■■■■	2	
Certification	1621LTK23Z	■■■■	2	
Project 2.1	1621LTK18Z	■■■■	12	
Dynamics 2	1620LTK09Z	■■■■	3	
Aircraft Systems Design	1621LTK19Z	■■■■	3	
Control Theory	1621LTK15Z	■■■■	3	
Aircraft Performance	1622LTK12Z	■■■■	3	
Thermodynamics and Propulsion	1621LTK20Z	■■■■	3	
Airfoil and Wing Theory	1621LTK21Z	■■■■	3	
Project 2.2	1621LTK22Z	■■■■	12	

Academic year 3

Unit of study	Code	Term	ECTS	Specific details
Basic curriculum				
Engineering Internship	1610LTI01Z	■■□□	30	
Graduation track: Design & Development				
Aircraft Structures 2	1615AE101Z	□□■■	3	
Advanced CAD	1621AE102Z	□□■■	1	
Business Administration	1612AE103Z	□□■■	2	
Flight Dynamics 1	1610DD104Z	□□■■	3	
Quality Management	1610AE201Z	□□■■	2	
Measurement Techniques	1610DD202Z	□□■■	4	
Flight Dynamics 2	1610DD203Z	□□■■	3	
Design, Build, Test project 3.1	1619DBTPRZ	□□■■	12	
Graduation track: Lightweight Structures				
Aircraft Structures 2	1615AE101Z	□□■■	3	
Advanced CAD	1621AE102Z	□□■■	1	
Business Administration	1612AE103Z	□□■■	2	
FEM	1619LS104Z	□□■■	3	
Quality Management	1610AE201Z	□□■■	2	
Composites Laminate Theory	1610LS202Z	□□■■	3	
Structural Optimisation	1619LS203Z	□□■■	4	
Design, Build, Test project 3.1	1619DBTPRZ	□□■■	12	

Academic year 4

Unit of study	Code	Term	ECTS	Specific details
Basic curriculum				
Graduation Project	1620LTI03Z	□□■■	30	AF PR
Elective: Gas Turbines				
Project 1	1610GT102Z	■□□□	5	
Gas Turbine Materials and Maintenance	1619GT101Z	■□□□	4	

Unit of study	Code	Term	ECTS	Specific details
Gas Turbine Theory	1619GT103Z	■□ □□	2	
Combustion & Emissions	1619GT104Z	■□ □□	2	
Gas Turbine Technology Trends 1	1619GT105Z	■□ □□	2	
Project 2	1610GT205Z	□■ □□	5	
Gas Turbine Performance & Simulation	1619GT201Z	□■ □□	5	
Gas Turbine Technology Trends 2	1619GT202Z	□■ □□	2	
Gas Turbine Industrial Applications	1619GT203Z	□■ □□	3	
Elective: Space Engineering				
Astrodynamics and Orbital Mechanics	1622SE101Z	■□ □□	3	
Space Propulsion	1622SE102Z	■□ □□	3	
Engineering for Space 1	1622SE103Z	■□ □□	3	
Space Project 1	1622SE104Z	■□ □□	6	
Space Applications and Mission Analysis	1622SE201Z	□■ □□	3	
Satellite Instrumentation	1622SE202Z	□■ □□	3	
Engineering for Space 2	1622SE203Z	□■ □□	3	
Space Project 2	1622SE204Z	□■ □□	6	
Graduation track: Design & Development				
Aerodynamic Design	1610DD301Z	■■ □□	5	
Control Systems Design	1612DD302Z	■■ □□	5	
Space Propulsion	1622SE102Z	■■ □□	3	
Helicopters	1610DD304Z	■■ □□	2	
Engineering Entrepreneurship Project	1612AE401Z	■■ □□	15	
Graduation track: Lightweight Structures				
Aircraft Structures 3	1615LS301Z	■■ □□	5	
Vibrations	1610LS302Z	■■ □□	3	
Fatigue	1614LS303Z	■■ □□	2	
Composites 2	1610LS304Z	■■ □□	5	

Unit of study	Code	Term	ECTS	Specific details
Engineering Entrepreneurship Project	1612AE401Z	■■ ■■	15	

Overview of tests

Legend

GRD	Grade assessment scale with the minimum score in parenthesis
SUS	Pass / fail scale
NIV	3-point level scale (exceeds the standard / meets the standard / does not yet meet the standard)
0%-100%	Weighting factor
SBU	Number of study hours
S/M/AW	Examination format (Written, Oral, Other method)
TZ	Examination session
AP	Compulsory attendance
LN	Longer timeframe for issuing results

Academic year 1

Unit of study	Test	Code	Scale	Weight	SBU	Mode	Specific details
Basic curriculum							
Introduction Aeronautical Engineering	Introduction Aeronautical Engineering	1616LTP01A	GRD(55)	100%	84	S	TZ
Mathematics 1	Mathematics 1	1612LTP03A	GRD(55)	100%	84	S	TZ
Statics 1	Statics 1	1616LTP04A	GRD(55)	100%	84	S	TZ
Project 1.1	Project 1.1	1621LTP27A	GRD(55)	100%	168	S	AP LN
Mathematics 2	Mathematics 2	1612LTP06A	GRD(55)	100%	84	S	TZ
Statics 2	Statics 2	1616LTP07A	GRD(55)	100%	84	S	TZ
Materials 1	Materials 1	1613LTP08A	GRD(55)	100%	56	S	TZ
CAD 1	CAD 1	1618LTP09A	SUS	100%	28	AW	
Project 1.2	Project 1.2	1621LTP28A	GRD(55)	100%	168	S	AP LN
Mathematics 3	Mathematics 3	1612LTP12A	GRD(55)	100%	84	S	TZ
Mechanics of Materials 1	Mechanics of Materials 1	1615LTP13A	GRD(55)	100%	56	S	TZ

Unit of study	Test	Code	Scale	Weight	SBU	Mode	Specific details
Aerodynamics 1	Aerodynamics 1	1616LTP18A	GRD(55)	100%	84	S	TZ
Manufacturing 1	Manufacturing 1	1616LTP22A	GRD(55)	100%	28	S	TZ
Project 1.3	Project 1.3	1621LTP29A	GRD(55)	100%	168	S	AP LN
Dynamics 1	Dynamics 1	1615LTP17A	GRD(55)	100%	84	S	TZ
Systems and Electronics 1	Systems and Electronics 1	1616LTP21A	GRD(55)	100%	84	S	TZ
Programming 1	Programming 1	1616LTP23A	GRD(55)	100%	84	AW	
Project 1.4	Project 1.4	1621LTP30A	GRD(55)	100%	168	S	AP LN

Academic year 2

Unit of study	Test	Code	Scale	Weight	SBU	Mode	Specific details
Basic curriculum							
Linear Algebra	Linear Algebra	1621LTK01A	GRD(55)	100%	56	S	TZ
Mechanics of Materials 2	Mechanics of Materials 2	1614LTK02A	GRD(55)	100%	84	S	TZ
Aircraft Structures 1	Aircraft Structures 1	1616LTK10A	GRD(55)	100%	56	S	TZ
Composites 1	Composites 1	1612LTK05A	GRD(55)	100%	56	S	TZ
Differential Equations	Differential Equations	1621LTK08A	GRD(55)	100%	84	S	TZ
Manufacturing 2	Manufacturing 2	1612LTK03A	GRD(55)	100%	56	S	
Statistics	Statistics	1612LTK17A	GRD(55)	100%	56	S	TZ
Certification	Certification	1621LTK23A	GRD(55)	100%	56	S	
Project 2.1	Project 2.1	1621LTK18A	GRD(55)	100%	336	S	AP LN
Dynamics 2	Dynamics 2	1614LTK09A	GRD(55)	100%	84	S	TZ
Aircraft Systems Design	Aircraft Systems Design	1621LTK19A	GRD(55)	100%	84	S	TZ
Control Theory	Control Theory	1612LTK15A	GRD(55)	100%	84	S	TZ
Aircraft Performance	Aircraft Performance	1612LTK12A	GRD(55)	100%	84	S	TZ
Thermodynamics and Propulsion	Thermodynamics and Propulsion	1621LTK20A	GRD(55)	100%	84	S	TZ
Airfoil and Wing Theory	Airfoil and Wing Theory	1621LTK21A	GRD(55)	100%	84	S	TZ
Project 2.2	Project 2.2	1621LTK22A	GRD(55)	100%	336	S	AP LN

Academic year 3

Unit of study	Test	Code	Scale	Weight	SBU	Mode	Specific details
Basic curriculum							
Engineering Internship	Engineering Internship	1610LTI01A	GRD(55)	100%	840	S	LN
Graduation track: Design & Development							
Aircraft Structures 2	Aircraft Structures 2	1615AE101A	GRD(55)	100%	84	S	TZ
Advanced CAD	Advanced CAD	1621AE102A	GRD(55)	100%	28	AW	
Business Administration	Business Administration	1612AE103A	GRD(55)	100%	56	AW	
Flight Dynamics 1	Flight Dynamics 1	1610DD104A	GRD(55)	100%	84	S	TZ
Quality Management	Quality Management	1610AE201A	GRD(55)	100%	56	AW	AP
Measurement Techniques	Measurement Techniques	1610DD202A	GRD(55)	50%	50	S	
	Lab Work	1610DD202B	GRD(55)	50%	50	AW	
	Labview	1610DD202C	SUS	0%	12	AW	
Flight Dynamics 2	Flight Dynamics 2	1610DD203A	GRD(55)	100%	56	S	TZ
	Flight Simulator	1610DD203B	SUS	0%	28	AW	
Design, Build, Test project 3.1	Design, Build, Test project 3.1	1619DBTPRA	GRD(55)	100%	336	S	AP LN
Graduation track: Lightweight Structures							
Aircraft Structures 2	Aircraft Structures 2	1615AE101A	GRD(55)	100%	84	S	TZ
Advanced CAD	Advanced CAD	1621AE102A	GRD(55)	100%	28	AW	
Business Administration	Business Administration	1612AE103A	GRD(55)	100%	56	AW	
FEM	Mechanics 7	1610LS104A	GRD(55)	100%	28	S	TZ
	FEM/Nastran	1610LS104B	SUS	0%	28	AW	
	Practical Strain Structures	1610LS104C	SUS	0%	28	AW	
Quality Management	Quality Management	1610AE201A	GRD(55)	100%	56	AW	AP
Composites Laminate Theory	Laminate Theory	1610LS202A	GRD(55)	80%	70	S	TZ
	Practical Laminate Theory	1610LS202B	GRD(55)	20%	14	S	AP

Unit of study	Test	Code	Scale	Weight	SBU	Mode	Specific details
Structural Optimisation	Structural Optimisation	1610LS203A	GRD(55)	50%	56	S	
	Materials Selection	1610LS203B	SUS	0%	28	S	
	Mechanical Joints	1610LS203C	GRD(55)	50%	28	S	
Design, Build, Test project 3.1	Design, Build, Test project 3.1	1619DBTPRA	GRD(55)	100%	336	S	AP LN

Academic year 4

Unit of study	Test	Code	Scale	Weight	SBU	Mode	Specific details
Basic curriculum							
Graduation Project	Final Assessment	1617LTI03B	GRD(55)	100%	840	S	LN
Elective: Gas Turbines							
Project 1	Project 1	1610GT102A	GRD(55)	100%	140	S	AP LN
Gas Turbine Materials and Maintenance	Gas Turbine Materials	1619GT101A	GRD(55)	50%	56	S	TZ
	Gas Turbine Maintenance	1619GT101B	GRD(55)	50%	56	S	TZ
Gas Turbine Theory	Gas Turbine Theory	1619GT103A	GRD(55)	100%	56	S	TZ
Combustion & Emissions	Combustion & Emissions	1619GT104A	GRD(55)	100%	56	AW	
Gas Turbine Technology Trends 1	Guest Lectures and Company Visits 1	1619GT105A	SUS	100%	56	AW	AP
Project 2	Project 2	1610GT205A	GRD(55)	100%	140	S	AP LN
Gas Turbine Performance & Simulation	Gas Turbine Performance	1619GT201A	GRD(55)	60%	80	S	
	Gas Turbine Simulation	1619GT201B	GRD(55)	40%	60	AW	
Gas Turbine Technology Trends 2	Guest Lectures and Company Visits 2	1619GT202A	SUS	100%	56	AW	AP
Gas Turbine Industrial Applications	Industrial Gas Turbines	1619GT203A	GRD(55)	60%	48	S	TZ
	Gas Turbine Auxiliaries	1619GT203B	GRD(55)	40%	36	S	TZ
Elective: Space Engineering							
Astrodynamics and Orbital Mechanics	Astrodynamics and Orbital Mechanics	1622SE101A	GRD(55)	100%	84	S	
Space Propulsion	Space Propulsion	1622SE102A	GRD(55)	100%	84	S	
Engineering for Space 1	Engineering for Space 1	1622SE103A	GRD(55)	100%	84	S	

Unit of study	Test	Code	Scale	Weight	SBU	Mode	Specific details
Space Project 1	Space Project 1	1622SE104A	GRD(55)	100%	168	S	AP LN
Space Applications and Mission Analysis	Space Applications and Mission Analysis	1622SE201A	GRD(55)	100%	84	S	
Satellite Instrumentation	Satellite Instrumentation	1622SE202A	GRD(55)	100%	84	S	TZ
Engineering for Space 2	Engineering for Space 2	1622SE203A	GRD(55)	100%	84	S	
Space Project 2	Space Project 2	1622SE204A	GRD(55)	100%	168	S	AP LN
Graduation track: Design & Development							
Aerodynamic Design	Aerodynamic Design Exam	1610DD301A	GRD(55)	60%	84	S	TZ
	Aerodynamic Design Assignment	1610DD301B	GRD(55)	40%	56	AW	
Control Systems Design	Control Theory Exam	1612DD302A	GRD(55)	100%	84	S	TZ
	Control Theory Assignment	1612DD302B	SUS	0%	56	AW	
Space Propulsion	Space Propulsion	1622SE102A	GRD(55)	100%	84	S	
Helicopters	Helicopters	1610DD304A	GRD(55)	100%	56	S	
Engineering Entrepreneurship Project	Research proposal	1612AE401A	SUS	0%	42	S	
	Technical Feasibility	1612AE401B	GRD(55)	70%	250	S	LN
	Business Feasibility	1612AE401C	GRD(55)	30%	126	S	LN
	Personal Feasibility	1612AE401D	SUS	0%	2	AW	
Graduation track: Lightweight Structures							
Aircraft Structures 3	Aircraft Structures 3	1615LS301A	GRD(55)	100%	98	S	TZ
	FEM Assignment	1615LS301B	SUS	0%	42	AW	
Vibrations	Vibrations	1610LS302A	GRD(55)	100%	84	S	TZ
Fatigue	Fatigue	1614LS303A	GRD(55)	100%	56	AW	
Composites 2	Composites 2	1610LS304A	GRD(55)	100%	84	S	TZ
	Composites Practical	1610LS304B	SUS	0%	56	AW	AP

Unit of study	Test	Code	Scale	Weight	SBU	Mode	Specific details
Engineering Entrepreneurship Project	Research proposal	1612AE401A	SUS	0%	42	S	
	Technical Feasibility	1612AE401B	GRD(55)	70%	250	S	LN
	Business Feasibility	1612AE401C	GRD(55)	30%	126	S	LN
	Personal Feasibility	1612AE401D	SUS	0%	2	AW	

Description courses

Introduction Aeronautical Engineering [1616LTP01Z]

Academic year	Term	Name of examination component	Study load in credits
1	blok 1	Introduction Aeronautical Engineering	3

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Introduction Aeronautical Engineering [1616LTP01A]	100%	GRD (1 t/m 100)	55	84

Content of unit of study	Aviation history Basic concepts of aerodynamics, aircraft performance, stability and control of the aircraft.
Learning outcomes	BoKS 3: Aerodynamics & Flight Mechanics BoKS 9: Professionalising
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	propedeuse
Qualitative requirement BSR	No

Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Introduction Aeronautical Engineering	1616LTP01A
Assessment objectives/criteria	The student is able to: • describe in a logical time-order developments within aviation from past till now (history) • describe the basic concepts of flying and aerodynamics • describe the basics of flight control and flight performance in terms of safety, efficiency and operations	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	Standard non-programmable calculator, set square / ruler	
Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Mathematics 1 [1612LTP03Z]

Academic year	Term	Name of examination component	Study load in credits
1	blok 1	Mathematics 1	3

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Mathematics 1 [	100%	Cijfer (10 t/m 100)	55	84

1612LTP03A]				

Content of unit of study	Mathematics 1
Learning outcomes	BoKS 1: Mathematics
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	propedeuse
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Mathematics 1	1612LTP03A
Assessment objectives/criteria	The student can: • conduct computations with fractions, powers and roots, with numbers and variables. • solve equations, inequalities and systems of equations possibly by factorization, long division with variables, completing the square and/or the quadratic formula, find an inverse function and transpose a formula. • recognise mathematical functions and compute and apply properties of these functions. • decompose a rational expression into partial fractions. • compute and apply properties of trigonometric functions and solve trigonometric equations. • compute properties of logarithmic and exponential functions and solve equations with these functions.	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	None	
Work methods and educational activities	Lectures and tutorials	

Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Statics 1 [1616LTP04Z]

Academic year	Term	Name of examination component	Study load in credits
1	blok 1	Statics 1	3

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Statics 1 [1616LTP04A]	100%	Cijfer (10 t/m 100)	55	84

Content of unit of study	Statics 1
Learning outcomes	BoKS 2: Structures & Mechanics
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	propedeuse
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Statics 1	1616LTP04A
Assessment objectives/criteria	The student	

	• Has knowledge of concepts like force, distributed load, moment and couple. Can determine resultants, decompose forces and for a given load case determine a statically equivalent force-couple system in 2D. • Can analyse and solve a problem systematically (e.g. using the SPA-method) and evaluate the answer. • Can translate a given structure with its load and supports to a schematic representation in the form of a free body diagram. • Can set up equations of equilibrium from a free body diagram. • Can solve equations of equilibrium to determine the support reactions.	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	Standard non-programmable calculator	
Work methods and educational activities	Lectures and tutorials	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Project 1.1 [1621LTP27Z]

Academic year	Term	Name of examination component	Study load in credits
1	blok 1	Project 1.1	6

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Project 1.1 [1621LTP27A]	100%	Cijfer (10 t/m 100)	55	168

Content of unit of study	Within Project 1.1 the focus lies on Performance at level 1
Learning outcomes	Competence 1. Analysis Competence 2. Design

	Competence 3. Realisation Competence 5. Management Competence 6. Advice Competence 7. Research Competence 8. Professionalisation
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	propedeuse
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Project 1.1	1621LTP27A
Assessment objectives/criteria	Competence 1. Analysis Competence 2. Design Competence 3. Realisation Competence 5. Management Competence 6. Advice Competence 7. Research Competence 8. Professionalisation	
Details of assessments	without test session	Project dossier Written without test session
Permitted Aids	N/A	
Work methods and educational activities	Project meetings, workshops, reviews, (Study) coaching	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Ja	Presence is required for achieving the competences and for the individual assessment.

Mathematics 2 [1612LTP06Z]

Academic year	Term	Name of examination component	Study load in credits
1	blok 2	Mathematics 2	3

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Mathematics 2 [1612LTP06A]	100%	Cijfer (10 t/m 100)	55	84

Content of unit of study	Mathematics 2
Learning outcomes	BoKS 1: Mathematics
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	propedeuse
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Mathematics 2	1612LTP06A
Assessment objectives/criteria	The student can: • apply rules for differentiation (product, quotient and chain rule) of (quotients of) polynomials, trigonometric functions, exponential functions and logarithmic functions. • produce an equation of the tangent. • determine extreme values and inflection points of functions. • find the area underneath/between curves. • solve improper integrals with correct notation.	

	• apply rules for integration (substitution, integration by parts, using partial fractions) of (quotients of) polynomials, trigonometric functions, exponential functions and logarithmic functions.	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	None	
Work methods and educational activities	Lectures and tutorials	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Statics 2 [1621LTP07Z]

Academic year	Term	Name of examination component	Study load in credits
1	blok 2	Statics 2	3

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Statics 2 [1616LTP07A]	100%	Cijfer (10 t/m 100)	55	84

Content of unit of study	Statics 2
Learning outcomes	BoKS 2: Structures & Mechanics
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	propedeuse
Qualitative requirement BSR	No
Graduation product designation	No

Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Statics 2	1616LTP07A
Assessment objectives/criteria	The student • The student is able to analyze the external and internal loads of a realistic structure. • The student can make a substantiated assessment of different ways to support a structure based on the resulting external and internal loads. • Can determine and draw the normal force, the shear force and the bending moment diagrams for statically determined beams, using the differential equations graphically (slopes and areas) and the method of sections (functions of distance).	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	Standard non-programmable calculator	
Work methods and educational activities	Lectures and tutorials	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Materials 1 [1622LTP08Z]

Academic year	**Term**	**Name of examination component**	**Study load in credits**
1	blok 2	Materials 1	2

Module name and code	**Weighting factor**	**Assessment scale**	**Required minimum score**	**Number of study hours**
Materials 1 [1613LTP08A]	100%	GRD (1 t/m 100)	55	56

Content of unit of study	Materials Science
Learning outcomes	BoKS 6: Materials & Manufacturing
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	propedeuse
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Materials 1	1613LTP08A
Assessment objectives/criteria	The student is able to • state the material properties and application type per material group • explain and compare mechanical properties, such as weight, stiffness and strength referring to e.g. crystal structure, metal structure, polymer chain, defects and type of binding • perform simple calculations based on mechanical properties • describe failure mechanisms and tests • describe the reaction of the material on environmental conditions (e.g. temperature and humidity) • describe how work, phases, heat treatments and alloying influence the mechanical properties • describe the processing of materials	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	Standard non-programmable calculator	
Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		

Compulsory attendance (See also Article 115 TER)	Nee	

CAD 1 [1618LTP09Z]

Academic year	Term	Name of examination component	Study load in credits
1	blok 2	CAD 1	1

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
CAD 1 [1618LTP09A]	100%	Voldoende / Onvoldoende	V	28

Content of unit of study	Learning how to design airplane parts using CATIA. CAD software is multi-platform software suite for computer-aided design (CAD) and computer-aided manufacturing (CAM).
Learning outcomes	BoKS 2: Structures & Mechanics BoKS 8: Research & Design BoKS 9: Professionalising
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	propedeuse
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	CAD 1	1618LTP09A
Assessment objectives/criteria	The student	

	• Is getting used with the basic functions for part design in CAD Software • Can create a 3D model • Can derive a 2D engineering drawing from a 3D model • Can create a 2D engineering drawing and a 3D model of an existing mechanical part (reverse engineering)	
Details of assessments	Andere wijze without test session	Skills test
Permitted Aids	N/A	
Work methods and educational activities	Workshop / tutorial	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Project 1.2 [1621LTP28Z]

Academic year	Term	Name of examination component	Study load in credits
1	blok 2	Project 1.2	6

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Project 1.2 [1621LTP28A]	100%	Cijfer (10 t/m 100)	55	168

Content of unit of study	Within Project 1.2 the focus lies on Structures at level 1
Learning outcomes	Competence 1. Analysis Competence 2. Design Competence 3. Realisation Competence 5. Management Competence 6. Advice

	Competence 7. Research Competence 8. Professionalisation
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	propedeuse
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Project 1.2	1621LTP28A
Assessment objectives/criteria	Competence 1. Analysis Competence 2. Design Competence 3. Realisation Competence 5. Management Competence 6. Advice Competence 7. Research Competence 8. Professionalisation	
Details of assessments	without test session	Project dossier Written without test session
Permitted Aids	N/A	
Work methods and educational activities	Project meetings, workshops, reviews, (Study) coaching	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Ja	Presence is required for achieving the competences and for the individual assessment.

Mathematics 3 [1612LTP12Z]

Academic year	Term	Name of examination component	Study load in credits
1	blok 3	Mathematics 3	3

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Mathematics 3 [1612LTP12A]	100%	Cijfer (10 t/m 100)	55	84

Content of unit of study	Mathematics 3
Learning outcomes	BoKS 1: Mathematics
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	propedeuse
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Mathematics 3	1612LTP12A
Assessment objectives/criteria	The student can: • perform numerical integration by the trapezoidal rule and Simpson’s rule. • apply the theory of the limit of a sum in calculating the volume, the surface and the center of gravity of flat areas and bodies of revolution. • apply the theory of integration in calculating the mass moment of inertia of a lamina and the length of a curve. • approximate a function by means of a Taylor series and/or MacLaurin series expansion. • find partial derivatives of multivariable functions and determine the stationary values and their nature. • apply the theory of differentiation and integration to solve an optimization problem.	

Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	Standard non-programmable calculator of the brand Casio fx-82 or TI-30	
Work methods and educational activities	Lectures and tutorials	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Mechanics of Materials 1 [1615LTP13Z]

Academic year	**Term**	**Name of examination component**	**Study load in credits**
1	blok 3	Mechanics of Materials 1	2

Module name and code	**Weighting factor**	**Assessment scale**	**Required minimum score**	**Number of study hours**
Mechanics of Materials 1 [1615LTP13A]	100%	Cijfer (10 t/m 100)	55	56

Content of unit of study	Mechanics of Materials 1
Learning outcomes	BoKS 2: Structures & Mechanics
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	propedeuse
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No

Specific details	None

Module with test	Mechanics of Materials 1	1615LTP13A
Assessment objectives/criteria	The student • Can translate the internal loads for simple connections to normal, shear and bearing stress. • Can calculate the deformation and strain of structural parts with a discrete axial (normal force) load. • Can determine the geometric properties centroid of area and area moment of inertia of beam cross sections. • Can determine the location of the neutral axis and calculate bending stresses in symmetric cross sections of beams loaded in pure bending. • Can calculate the shear stress, angle of twist and power transmission for rotationally symmetric cross sections loaded in torsion.	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	Standard non-programmable calculator	
Work methods and educational activities	Lectures and tutorials	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Aerodynamics 1 [1622LTP18Z]

Academic year	**Term**	**Name of examination component**	**Study load in credits**
1	blok 3	Aerodynamics 1	3

Module name and code	**Weighting factor**	**Assessment scale**	**Required minimum score**	**Number of study hours**

Aerodynamics 1 [1616LTP18A]	100%	Cijfer (10 t/m 100)	55	84

Content of unit of study	Basic fluid mechanics
Learning outcomes	BoKS 3: Aerodynamics & Flight Mechanics
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	propedeuse
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Aerodynamics 1	1616LTP18A
Assessment objectives/criteria	The student is able to • use and describe the build-up of the International Standard Atmosphere. • set-up the equilibrium equations of the airplane in steady cruise, climbing and descending flight, and based on those equations is able to calculate the force coefficients. • use basic fluid terms and fluid measurement methods. • apply the continuity equation. • apply Bernoulli’s equation. • apply the momentum equation using a control volume.	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	Standard non-programmable calculator	
Work methods and educational activities	Lectures and tutorials	
Contact hours for strategies and teaching		

activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Manufacturing 1 [1621LTP22Z]

Academic year	Term	Name of examination component	Study load in credits
1	blok 3	Manufacturing 1	1

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Manufacturing 1 [1616LTP22A]	100%	Cijfer (10 t/m 100)	55	28

Content of unit of study	Manufacturing 1 Basic understanding of manufacturing, production methods in predominantly metals.
Learning outcomes	BoKS 6: Materials & Manufacturing BoKS 9: Professionalising
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	propedeuse
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Manufacturing 1	1616LTP22A

Assessment objectives/criteria	The student is capable of: • Naming the multiple manufacturing methods and the pros and cons • Naming the multiple machines and their properties • Naming the pros and cons of the different manufacturing processes and techniques during the design process • Describing the factor quality	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	Standard non-programmable calculator, set square / ruler	
Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Project 1.3 [1621LTP29Z]

Academic year	Term	Name of examination component	Study load in credits
1	blok 3	Project 1.3	6

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Project 1.3 [1621LTP29A]	100%	Cijfer (10 t/m 100)	55	168

Content of unit of study	Within Project 1.3 the focus lies on Manufacturing at level 1
Learning outcomes	Competence 1. Analysis Competence 2. Design Competence 3. Realisation Competence 5. Management Competence 6. Advice

	Competence 7. Research Competence 8. Professionalisation
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	propedeuse
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Project 1.3	1621LTP29A
Assessment objectives/criteria	Competence 1. Analysis Competence 2. Design Competence 3. Realisation Competence 5. Management Competence 6. Advice Competence 7. Research Competence 8. Professionalisation	
Details of assessments	without test session	Project dossier Written without test session
Permitted Aids	N/A	
Work methods and educational activities	Project meetings, workshops, reviews, (Study) coaching	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Ja	Presence is required for achieving the competences and for the individual assessment.

Dynamics 1 [1615LTP17Z]

Academic year	Term	Name of examination component	Study load in credits
1	blok 4	Dynamics 1	3

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Dynamics 1 [1615LTP17A]	100%	GRD (1 t/m 100)	55	84

Content of unit of study	Dynamics 1
Learning outcomes	BoKS 2: Structures & Mechanics
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	propedeuse
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Dynamics 1	1615LTP17A
Assessment objectives/criteria	The student: • Can determine the relation between the resultant force on a moving body and its acceleration by means of the second law of Newton and using a free body diagram and a kinetic diagram. • Can analyse the acceleration, velocity and position of a moving body using the relationship between these physical quantities both mutually and with time for a rectilinear motion (1D). • Can analyse the acceleration, velocity and position of a moving body using the relationship between these physical quantities both mutually and with time for a planar curvilinear motion (2D) using Cartesian co-ordinates. • Can derive kinematic equations that describe the relation of the motion of two or more connected bodies (constrained motion).	

	• Can analyse the motion of a moving body using work and energy equations.	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	Standard non-programmable calculator	
Work methods and educational activities	Lectures and tutorials	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Systems and Electronics 1 [1616LTP21Z]

Academic year	Term	Name of examination component	Study load in credits
1	blok 4	Systems and Electronics 1	3

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Systems and Electronics 1 [1616LTP21A]	100%	Cijfer (10 t/m 100)	55	84

Content of unit of study	• Current /voltage/ resistor, current/ voltage source, Ohm's Law, Series/parallel resistor and power calculations. • Voltage divider, first and second law of Kirchoff and calculations with Kirchoff's Laws. • Current divider, Thevenin's/ Norton's theorem and examples Thevenin/ Norton. • Alternating current theory and effective values of an alternating voltage/current. • Sensors, Actuators and their applications: Strain gauge, Hall sensors, Solenoids, Dc motors, Servo and Stepper motors).

Learning outcomes	BoKS 5: Electronics, Systems & Control
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	propedeuse
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Systems and Electronics 1	1616LTP21A
Assessment objectives/criteria	The student • can explain the principal current source and voltage source for both AC and DC. • can calculate resistances, currents, voltages and power in series and parallel circuits. • can calculate, currents, voltages in circuits by means of Kirchoff's laws. • can change circuits consisting of current/voltage sources to 1 current/ voltage source with 1 impedance. • can perform calculations on DC configurations w.r.t. current, voltage and power, containing resistors. • can model sources and loads using passive elements (resistors). • understands the basic mechanical function and electrical characteristics of a few sensors and actuators (strain gauges, Hall sensors, solenoids and electrical valves, DC, stepper and servo motors).	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	Standard non-programmable calculator	
Work methods and educational activities	Lectures and tutorials	
Contact hours for strategies and teaching activities		

Compulsory attendance (See also Article 115 TER)	Nee	

Programming 1 [1616LTP23Z]

Academic year	Term	Name of examination component	Study load in credits
1	blok 4	Programming 1	3

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Programming 1 [1616LTP23A]	100%	Cijfer (10 t/m 100)	55	84

Content of unit of study	Upon completion of this class, students will be able to write small programs in the Python programming language to solve real-world engineering problems. Subjects and themes: • Introduction to Computers, Programs and Python, Basic Python Syntax, Collections. • Language Components. • Creating Functions and Modules. • Classes, Methods and Employing Inheritance. • Using files and Exception Handling. • Introduction to Raspberry Pi and the Raspberry Pi Programming Environment. • Python Programming for Raspberry Pi (GPIO control).
Learning outcomes	BoKS 1: Mathematics BoKS 5: Electronics, Systems & Control BoKS 9: Professionalising
Requirements for participation in units of study (See also article 31a TER)	None

Phase of Bachelor's programme	propedeuse
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Programming 1	1616LTP23A
Assessment objectives/criteria	The students will be able to write small programs in the Python programming language to solve real-world engineering problems. This includes the following topics: • Basic Python Syntax and Collections (List and tuple). • Language Components. • Creating Functions and Modules. • Classes and Methods. • Exception Handling. • Python Programming for Raspberry Pi (GPIO control).	
Details of assessments	Andere wijze without test session	Regular: A. Final assignment [100%] Resit: S Resit assignment [100%]
Permitted Aids	All notes, static documents (PPTs and previous programmes on Internet)	
Work methods and educational activities	Tutorial Instruction classes	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Project 1.4 [1621LTP30Z]

Academic year	Term	Name of examination component	Study load in credits
1	blok 4	Project 1.4	6

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Project 1.4 [1621LTP30A]	100%	Cijfer (10 t/m 100)	55	168

Content of unit of study	Within Project 1.4 the focus lies on Smart Systems at level 1
Learning outcomes	Competence 1. Analysis Competence 2. Design Competence 3. Realisation Competence 5. Management Competence 6. Advice Competence 7. Research Competence 8. Professionalisation
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	propedeuse
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Project 1.4	1621LTP30A
Assessment objectives/criteria	Competence 1. Analysis Competence 2. Design Competence 3. Realisation	

	Competence 5. Management Competence 6. Advice Competence 7. Research Competence 8. Professionalisation	
Details of assessments	without test session	Project dossier Written without test session
Permitted Aids	N/A	
Work methods and educational activities	Project meetings, workshops, reviews, (Study) coaching	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Ja	Presence is required for achieving the competences and for the individual assessment.

Linear Algebra [1621LTK01Z]

Academic year	Term	Name of examination component	Study load in credits
2	blok 1	Linear Algebra	2

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Linear Algebra [1621LTK01A]	100%	Cijfer (10 t/m 100)	55	56

Content of unit of study	Linear Algebra
Learning outcomes	BoKS 1: Mathematics
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No

Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Linear Algebra	1621LTK01A
Assessment objectives/criteria	The student: • Is able to solve systems of linear equations using elementary row operations and using the inverse matrix • Understands the relation between determinants and solutions of systems of linear equations • Is able to apply the concept of linear transformations (reflection, rotation, projection, translation) • Is able to determine eigenvalues and eigenvectors of a matrix • Is able to determine the rank of a matrix • Is able to determine the number of solutions of a system of linear equations using the rank	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	Standard non-programmable calculator	
Work methods and educational activities	Lectures and tutorials	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Mechanics of Materials 2 [1621LTK02Z]

Academic year	Term	Name of examination component	Study load in credits
2	blok 1	Mechanics of Materials 2	3

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Mechanics of Materials 2 [1614LTK02A]	100%	Cijfer (10 t/m 100)	55	84

Content of unit of study	Mechanics of Materials 2
Learning outcomes	BoKS 2: Structures & Mechanics
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Mechanics of Materials 2	1614LTK02A
Assessment objectives/criteria	The student is able to: • Determine the elastic line of the deflection of beams under statically determined conditions • Determine the deflection of beams under statically determined as well as undetermined conditions using the superposition method • Determine the shear flow/-stress as well as the location of the shear center due to transverse loaded beam • Determine the normal- and shear stress in a chosen direction of a thin plate element (plain stress)	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	Standard non-programmable calculator	
Work methods and educational activities	Lectures and tutorials	

Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Aircraft Structures 1 [1616LTK10Z]

Academic year	Term	Name of examination component	Study load in credits
2	blok 1	Aircraft Structures 1	2

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Aircraft Structures 1 [1616LTK10A]	100%	Cijfer (10 t/m 100)	55	56

Content of unit of study	Detail stressing for metals, loads, mechanical properties of aircraft materials Analysing structure for failure modes Lug strength analysis Euler buckling Fatigue damage analysis with Miners' rule Pre-stressed bolts Mechanical joints Bolts in a row
Learning outcomes	BoKS 2: Structures & Mechanics
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No

Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Aircraft Structures 1	1616LTK10A
Assessment objectives/criteria	The student is able to: • look up and apply MMPDS material and fastener data • apply design values in analyses • determine external and internal loads for simple structures • recognise and name critical failure modes • present a summary of Margins of safety and draw a conclusion • dimension a lug or bolt using strength analyses • calculate margins of safety • use the V-n diagram and loads • calculate Euler buckling • calculate fatigue damage and apply Palmgren-Miner's rule • calculate the effect of pre-stressed tension bolts • calculate the strength of a connection with more bolts in a row at limit load and at ultimate load • look up and apply fastener properties • calculate connections with more bolts in a row ◦ with respect to internal load and stresses in material ◦ and determine the stiffness distribution in the material • determine bolt forces	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	Standard non-programmable calculator, set square / ruler.	
Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		

Compulsory attendance (See also Article 115 TER)	Nee	

Composites 1 [1621LTK05Z]

Academic year	Term	Name of examination component	Study load in credits
2	blok 1	Composites 1	2

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Composites 1 [1612LTK05A]	100%	Cijfer (10 t/m 100)	55	56

Content of unit of study	Composite materials
Learning outcomes	BoKS 2: Structures & Mechanics BoKS 6: Materials & Manufacturing
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Composites 1	1612LTK05A
Assessment objectives/criteria	The student is able to explain: • Which composites are most frequently used in aerospace industry and why. • Which kinds of tooling are used.	

	• How composites for structural applications are produced. • In which way composites can best be joined to each other. • What the differences are between the behavior of metals and composites. • How the environment influences the material properties.	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	Standard non-programmable calculator	
Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Differential Equations [1621LTK08Z]

Academic year	Term	Name of examination component	Study load in credits
2	blok 2	Differential Equations	3

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Differential Equations [1621LTK08A]	100%	Cijfer (10 t/m 100)	55	84

Content of unit of study	Differential Equations
Learning outcomes	BoKS 1: Mathematics
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No

Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Differential Equations	1621LTK08A
Assessment objectives/criteria	The student is able to: • solve first order differential equations by applying separation of variables and by using an integrating factor. • solve inhomogeneous, second order linear differential equations with constant coefficients by solving the corresponding homogeneous equation and determining one solution of the inhomogeneous equation. • apply the definition of the Laplace transform to simple functions. • apply the Laplace transform to more complex functions using standard Laplace transforms (table) and is able to apply this for solving inhomogeneous second order linear differential equations with constant coefficients.	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	Standard non-programmable calculator	
Work methods and educational activities	Lectures and tutorials	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Manufacturing 2 [1612LTK03Z]

Academic year	Term	Name of examination component	Study load in credits

2	blok 2	Manufacturing 2	2

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Manufacturing 2 [1612LTK03A]	100%	Cijfer (10 t/m 100)	55	56

Content of unit of study	Manufacturing 2 Manufacturing technology, Quality, Costs, Lean Manufacturing
Learning outcomes	BoKS 6: Materials & Manufacturing
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Manufacturing 2	1612LTK03A
Assessment objectives/criteria	The student can: • Indicate how manufacturing companies function • Show how the design of a product influences the manufacturability • Indicate which possibilities there are to model and improve a production process • Perform a simple cost calculation for a product • Show how quality control processes can improve the product • Explain the principles of Lean Manufacturing	
Details of assessments	Schriftelijk without test session	Assignment
Permitted Aids	N/A	

Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Statistics [1617LTK17Z]

Academic year	Term	Name of examination component	Study load in credits
2	blok 2	Statistics	2

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Statistics [1612LTK17A]	100%	Cijfer (10 t/m 100)	55	56

Content of unit of study	Statistics
Learning outcomes	BoKS 1: Mathematics
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Statistics	1612LTK17A
Assessment objectives/criteria	The student:	

	• is able to distinguish between quantitative/ qualitative variables, continuous/discrete variables and the different measure scales of a variable and is able to describe the concepts sample and population. • is able to categorize data and to draw histograms, (cumulative) frequency polygons, diagrams and graphs. • is able to apply knowledge of central tendencies, measures of dispersion, simple data transforms; is able to conduct calculations to find these quantities and to find percentages corresponding to an interval. • is able to apply knowledge of the normal distribution; to use a z-table; to find out if a variable has a normal distribution. • is able to compute mean and variance of sums and differences of variables and can apply these quantities. • is able to apply basic probability theory to determine probabilities and percentages. • is able to apply knowledge of the binomial distribution, apply the formula and table, and is able to verify whether the distribution can be approximated by the normal distribution.	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	Standard non-programmable calculator	
Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Certification [1621LTK23Z]

Academic year	Term	Name of examination component	Study load in credits
2	blok 2	Certification	2

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours

Certification [1621LTK23A]	100%	Cijfer (10 t/m 100)	55	56

Content of unit of study	Certification
Learning outcomes	BoKS 7: Business, Airworthiness & Operations
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Certification	1621LTK23A
Assessment objectives/criteria	On completion of the course, you will be able to: • Understand the issues to be faced for the certification of new systems and aircraft. • Describe the legal basis which underpins airworthiness regulation in aircraft design, production and operation. • Demonstrate an understanding of the regulatory background behind the assessment of aircraft and its subsystems. • Understand safety assessment in the overall context of aircraft certification. • Interpret the principles of airworthiness as applied to the process of aircraft certification.	
Details of assessments	Schriftelijk without test session	Exam
Permitted Aids	Standard non-programmable calculator	
Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		

Compulsory attendance (See also Article 115 TER)	Nee	

Project 2.1 [1621LTK18Z]

Academic year	Term	Name of examination component	Study load in credits
2	semester 1	Project 2.1	12

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Project 2.1 [1621LTK18A]	100%	Cijfer (10 t/m 100)	55	336

Content of unit of study	Project work and practical skills
Learning outcomes	Competence 1. Analysis Competence 2. Design Competence 3. Realisation Competence 4. Control Competence 5. Management Competence 6. Advice Competence 7. Research Competence 8. Professionalisation
Requirements for participation in units of study (See also article 31a TER)	Projects of year 1 have to be finished before participating in the projects of year 2.
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	Geen

Module with test	Project 2.1	1621LTK18A
Assessment objectives/criteria	Competence 1. Analysis Competence 2. Design Competence 3. Realisation Competence 4. Control Competence 5. Management Competence 6. Advice Competence 7. Research Competence 8. Professionalisation	
Details of assessments	without test session	Project dossier Written without test session
Permitted Aids	N/A	
Work methods and educational activities	Project meetings, workshops, reviews, (Study) coaching	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Ja	Presence is required for achieving the competences and for the individual assessment.

Dynamics 2 [1620LTK09Z]

Academic year	Term	Name of examination component	Study load in credits
2	blok 3	Dynamics 2	3

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Dynamics 2 [1614LTK09A]	100%	Cijfer (10 t/m 100)	55	84

Content of unit of study	Dynamics 2
Learning outcomes	BoKS 1: Mathematics BoKS 2: Structures & Mechanics

Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Dynamics 2	1614LTK09A
Assessment objectives/criteria	The student: • Can analyse the acceleration, velocity and position of a moving body using the relationship between these physical quantities both mutually and with time for a planar curvilinear motion (2D) using normal-tangential co-ordinates and polar co-ordinates; • Can, using Newton's second law of motion, a free body diagram and a kinetic diagram, set up and solve dynamic equation for planar motions and forces acting on a particle; • Can, using Newton's second law of motion, a free body diagram and a kinetic diagram, set up and solve dynamic equation for planar motions and forces acting on a rigid body; • Can analyse the planar motion of particles using linear and/or angular impulse and momentum equations.	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	Standard non-programmable calculator	
Work methods and educational activities	Lectures and tutorials	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Aircraft Systems Design [1621LTK19Z]

Academic year	Term	Name of examination component	Study load in credits
2	blok 3	Aircraft Systems Design	3

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Aircraft Systems Design [1621LTK19A]	100%	Cijfer (10 t/m 100)	55	84

Content of unit of study	Aircraft Systems
Learning outcomes	BoKS 5: Electronics, Systems & Control BoKS 7: Business, Airworthiness & Operations
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Aircraft Systems Design	1621LTK19A
Assessment objectives/criteria	The student can • state the various subsystems of an aircraft, describe their functions and interaction • explain the principles of the navigation systems used in aviation • explain the operating principle of fight instruments • explain the basics of an aircraft electrical system • explain the operating principle of a pneumatic / airconditioning system	

	• explain the operating principle of a cabin pressurization system • explain the working principle of an APU • explain the working principle of an automatic pilot, such as a pitch control, altitude control or autothrottle system and the used components (sensors, electronics, computer, etc.)	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	Standard non-programmable calculator	
Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Control Theory [1621LTK15Z]

Academic year	**Term**	**Name of examination component**	**Study load in credits**
2	blok 3	Control Theory	3

Module name and code	**Weighting factor**	**Assessment scale**	**Required minimum score**	**Number of study hours**
Control Theory [1612LTK15A]	100%	Cijfer (10 t/m 100)	55	84

Content of unit of study	Control Theory
Learning outcomes	BoKS 1: Mathematics BoKS 2: Structures & Mechanics BoKS 3: Aerodynamics & Flight Mechanics BoKS 5: Electronics, Systems & Control BoKS 8: Research & Design

Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Control Theory	1612LTK15A
Assessment objectives/criteria	The student • Has skills in determining output signals from S(ingel)I(nput)S(ingle)O(utput)-system input signals using Laplace and inverse Laplace transforms. • Is able to describe/model mechanical systems in time- and frequency (s) domain. • Is able to explain behaviour of SISO systems in time- and frequency domain. • Is able to determine transfer functions from composed block diagrams • Is able to analyse and design first- and second order systems using a proportional controller.	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	Standard non-programmable calculator	
Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Aircraft Performance [1622LTK12Z]

Academic year	Term	Name of examination component	Study load in credits
2	blok 4	Aircraft Performance	3

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Aircraft Performance [1612LTK12A]	100%	Cijfer (10 t/m 100)	55	84

Content of unit of study	Aircraft Perfomance
Learning outcomes	BoKS 3: Aerodynamics & Flight Mechanics
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Aircraft Performance	1612LTK12A
Assessment objectives/criteria	The student is able to • calculate the integral performance (take-off, landing, cruise, climb and descent) of an aircraft. • calculate the point performance (steady gliding flight, steady powered flight, steady coordinated turn) of an aircraft. • derive the point performance (steady gliding flight, steady powered flight) of an aircraft. • use performance diagrams and hodographs/flight polars to determine performance parameters of an aircraft. • describe and explain definitions and effects of parameters in aircraft performance.	
Details of assessments	Schriftelijk	Exam

	with test session	
Permitted Aids	Standard non-programmable calculator	
Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Thermodynamics and Propulsion [1621LTK20Z]

Academic year	Term	Name of examination component	Study load in credits
2	blok 4	Thermodynamics and Propulsion	3

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Thermodynamics and Propulsion [1621LTK20A]	100%	Cijfer (10 t/m 100)	55	84

Content of unit of study	Thermodynamics and propulsion
Learning outcomes	BoKS 4: Thermodynamics & Propulsion
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Thermodynamics and Propulsion	1621LTK20A
Assessment objectives/criteria	The student can: • describe the basic concepts and definitions of thermodynamics. • use, calculate and determine thermodynamic properties. • determine the process diagrams of processes and cycles. • calculate closed systems by using the laws of thermodynamics. • calculate open systems by using the laws of thermodynamics. • determine performance parameters of a Joule-Brayton cycle.	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	Standard non-programmable calculator	
Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Airfoil and Wing Theory [1621LTK21Z]

Academic year	Term	Name of examination component	Study load in credits
2	blok 4	Airfoil and Wing Theory	3

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Airfoil and Wing Theory [1621LTK21A]	100%	Cijfer (10 t/m 100)	55	84

Content of unit of study	Aerodynamics of airfoils and wings
Learning outcomes	BoKS 3: Aerodynamics & Flight Mechanics

Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Airfoil and Wing Theory	1621LTK21A
Assessment objectives/criteria	The student is able to: • analyse the pressure distribution of a 2D airfoil. • calculate the aerodynamic coefficients as well as the centre of pressure and aerodynamic centre of a 2D airfoil. • describe 2D viscous flow and boundary layer effects on the flow around airfoils and wings (laminar and turbulent flow, separation, transition). • explain the background principles of the airfoil and wing theory (including induced angle of attack and induced drag) and apply the formulas. • apply the law of Biot Savart to calculate induced velocities and model 3D flow around a wing using the Prandtl lifting line theory. • describe and calculate the parameters that describe a three dimensional wing, including definitions of taper ratio, aspect ratio, aerodynamic and geometric twist, wing sweep and dihedral. • explain the effects of variation in geometry of a wing on the lift distribution and induced drag of a wing.	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	Standard non-programmable calculator	
Work methods and educational activities	Lectures	

Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Project 2.2 [1621LTK22Z]

Academic year	Term	Name of examination component	Study load in credits
2	semester 2	Project 2.2	12

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Project 2.2 [1621LTK22A]	100%	Cijfer (10 t/m 100)	55	336

Content of unit of study	Project work and practical skills
Learning outcomes	Competence 1. Analysis Competence 2. Design Competence 3. Realisation Competence 4. Control Competence 5. Management Competence 6. Advice Competence 7. Research Competence 8. Professionalisation
Requirements for participation in units of study (See also article 31a TER)	Projects of year 1 have to be finished before participating in the projects of year 2.
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No

Professional part	No
Specific details	None

Module with test	Project 2.2	1621LTK22A
Assessment objectives/criteria	Competence 1. Analysis Competence 2. Design Competence 3. Realisation Competence 4. Control Competence 5. Management Competence 6. Advice Competence 7. Research Competence 8. Professionalisation	
Details of assessments	without test session	Project dossier Written without test session
Permitted Aids	N/A	
Work methods and educational activities	Project meetings, workshops, reviews, (Study) coaching	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Ja	Presence is required for achieving the competences and for the individual assessment.

Engineering Internship [1610LTI01Z]

Academic year	Term	Name of examination component	Study load in credits
3	semester 1	Engineering Internship	30

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Engineering Internship [1610LTI01A]	100%	Cijfer (10 t/m 100)	55	840

Content of unit of study	Third year internship (major part)
Learning outcomes	Compulsory competences: Competence 1. Analysis (level 2) Competence 5. Management (level 1 → 2) Competence 7. Research (level 1 → 2) Competence 8. Professionalisation (level 2) Next to compulsory competences at least one of the next competences has to be chosen before start of internship: Competence 2. Design (level 2) Competence 3. Realisation (level 1 → 2) Competence 4. Control (level 1 → 2) Competence 6. Advice (level 1 → 2)
Requirements for participation in units of study (See also article 31a TER)	A student is only allowed to start the Engineering Internship after he/she has completed at least 110 ECs in the first two years of the curriculum and has no deficiencies in the first year. Assignment has to be discussed with the study career coach and to be approved by internship coordinator.
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	The internship should be at least 100 working days.

Module with test	Engineering Internship	1610LTI01A
Assessment objectives/criteria	Compulsory competences: Competence 1. Analysis (level 2) Competence 5. Management (level 1 → 2) Competence 7. Research (level 1 → 2) Competence 8. Professionalisation (level 2) Next to compulsory competences at least one of the next competences has to be chosen before start of internship:	

	Competence 2. Design (level 2) Competence 3. Realisation (level 1 → 2) Competence 4. Control (level 1 → 2) Competence 6. Advice (level 1 → 2)	
Details of assessments	without test session	Project dossier
Permitted Aids	N/A	
Work methods and educational activities	Internship	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Graduation Project [1620LTI03Z]

Academic year	Term	Name of examination component	Study load in credits
4	semester 2	Graduation Project	30

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Final Assessment [1617LTI03B]	100%	Cijfer (10 t/m 100)	55	840

Content of unit of study	
Learning outcomes	
Requirements for participation in units of study (See also article 31a TER)	
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	Yes

Sets requirement for the work environment	No
Professional part	No
Specific details	

Module with test	Final Assessment	1617LTI03B
Assessment objectives/criteria	As the objective for graduation it applies that the student learns • To perform interdisciplinary as a trainee engineer in a company • To test, apply and deepen the theoretical and practical knowledge achieved in the training, or the knowledge to be newly obtained • To independently analyse and elaborate a given assignment, and to come to a result, possibly with realization of a product, within the time available for that • To develop his communicative and social skills and problem-solving ability • To further develop insight into his own career wishes and opportunities	
Details of assessments	without test session	The grade for the final assessment is based on the following items (AS-07): • Presentations and final review (AS-08 & AS-09): 10% • Research and Reporting (AS-10 & AS-11): 50% • Competences (AS-12): 20% • Quality of output: 20%
Permitted Aids	N/A	
Work methods and educational activities	• Final report • Final review session • Poster session presentation • Company presentation • Interim report • Interim assessment	
Contact hours for strategies and teaching activities		

Compulsory attendance (See also Article 115 TER)	Nee	

Aircraft Structures 2 [1615AE101Z]

Academic year	Term	Name of examination component	Study load in credits
3	semester 2	Aircraft Structures 2	3

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Aircraft Structures 2 [1615AE101A]	100%	Cijfer (10 t/m 100)	55	84

Content of unit of study	Stability of thin-walled structures like stiffened panels, columns and beams, loaded by a compression and/or shear load.
Learning outcomes	BoKS 2: Structures & Mechanics BoKS 6: Materials & Manufacturing
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Aircraft Structures 2	1615AE101A
Assessment objectives/criteria	The student is able to: • Explain which areas in the structure of an aircraft fuselage / wing are critical for stability	

	• Explain the principles and failure criteria in relation to instability of thin-walled structures • Determine (by means of calculations) the critical buckling failure loads and failure modes for columns loaded by a constant compression load (inclusive post-buckling behaviour) • Determine (by means of calculations) the critical buckling failure loads and failure modes for thin-walled stiffened panels loaded by a constant compression load (inclusive post-buckling behaviour) • Determine (by means of calculations) the critical buckling failure loads and failure modes for thin-walled stiffened beams loaded by a constant shear load (inclusive post-buckling behaviour) • Determine the effect of different materials, material limitations (inelasticity effects), geometrical limitations and initial imperfections (tolerances) on buckling failure loads of stiffened panels and beams	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	Standard non-programmable calculator	
Work methods and educational activities	Lectures and tutorials	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Advanced CAD [1621AE102Z]

Academic year	Term	Name of examination component	Study load in credits
3	semester 2	Advanced CAD	1

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Advanced CAD [1621AE102A]	100%	Cijfer (10 t/m 100)	55	28

Content of unit of study	
Learning outcomes	
Requirements for participation in units of study (See also article 31a TER)	
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	

Module with test	Advanced CAD	1621AE102A
Assessment objectives/criteria		
Details of assessments	Andere wijze without test session	
Permitted Aids		
Work methods and educational activities		
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Business Administration [1612AE103Z]

Academic year	Term	Name of examination component	Study load in credits
3	semester 2	Business Administration	2

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Business Administration [1612AE103A]	100%	Cijfer (10 t/m 100)	55	56

Content of unit of study	Business Administration
Learning outcomes	BoKS 7: Business, Airworthiness & Operations
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Business Administration	1612AE103A
Assessment objectives/criteria	The student is able to: • Communicate effectively in formal situations, • Estimate costs, do cost calculations and determine selling strategy, • Take business and financial aspects into account, • Define and evaluate a simple aircraft supply chain • Understand the basics of airline operations	
Details of assessments	Andere wijze without test session	Assignments
Permitted Aids	N/A	
Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		

Compulsory attendance (See also Article 115 TER)	Nee	

Flight Dynamics 1 [1610DD104Z]

Academic year	Term	Name of examination component	Study load in credits
3	semester 2	Flight Dynamics 1	3

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Flight Dynamics 1 [1610DD104A]	100%	Cijfer (10 t/m 100)	55	84

Content of unit of study	Flight Dynamics 1
Learning outcomes	BoKS 3: Aerodynamics & Flight Mechanics
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Flight Dynamics 1	1610DD104A
Assessment objectives/criteria	The student is able to: • Explain the importance of the position of the centre of gravity in terms of Flight Dynamics • Explain and determine the static stability and control of an aircraft using a simplified model	

	• Explain and determine the effect of the position of the aerodynamic centre, the neutral point, centre of pressure, manoeuvring point • Explain aircraft motion quantitatively after disturbing a stationary flight • Explain and determine the influence of aircraft configuration and stability derivatives on aircraft behaviour during flight • Understand the modelling of the aircraft equations of motion • Determine the aircraft motion from a dynamic aircraft model	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	Standard non-programmable calculator	
Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Quality Management [1610AE201Z]

Academic year	Term	Name of examination component	Study load in credits
3	semester 2	Quality Management	2

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Quality Management [1610AE201A]	100%	Cijfer (10 t/m 100)	55	56

Content of unit of study	Quality Management
Learning outcomes	BoKS 6: Materials & Manufacturing BoKS 7: Business, Airworthiness & Operations

Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Quality Management	1610AE201A
Assessment objectives/criteria	After this course the student: • Has knowledge of the background and the fundamentals of Quality Management • Can name the 3 pillars of QM and the 8 principles of QM • Can tell (in own words) the activities during the QP, QC and QI phase • Can distinguish the differences and similarities between the ISO approach and the process approach to Quality management.	
Details of assessments	Andere wijze without test session	Assignments
Permitted Aids	N/A	
Work methods and educational activities	Tutorials	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Ja	80% presence is required. If not, in consultation with the lecturer, the student can hand in a supplementary assignment.

Measurement Techniques [1610DD202Z]

Academic year	Term	Name of examination component	Study load in credits
3	semester 2	Measurement Techniques	4

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Measurement Techniques [1610DD202A]	50%	Cijfer (10 t/m 100)	55	50
Lab Work [1610DD202B]	50%	Cijfer (10 t/m 100)	55	50
Labview [1610DD202C]	0%	Voldoende / Onvoldoende	V	12

Content of unit of study	Measurement Techniques Experiments
Learning outcomes	BoKS 5: Electronics, Systems & Control BoKS 6: Materials & Manufacturing BoKS 9: Professionalising
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Measurement Techniques	1610DD202A
Assessment objectives/criteria	The student is able to: • Draw a concept map for a generalised measurement system that identifies the most important concepts.	

	• Apply basic statistical methods to design experiments, to analyze, and to present the results of experiments. Such methods may include identification of probability distributions of experimental data, estimation of population statistics from large and small samples, classification and propagation of error sources for experiment design and analysis of results, and graphical presentation of statistical descriptions. • Identify and describe the various types of mechanical measurements including temperature, pressure, motion and position, force and torque, stress and strain, flow visualization and measurement (e.g., volume flow rate, velocity, etc.) and explain the transduction principles that underlie them.	
Details of assessments	Schriftelijk without test session	Assignments
Permitted Aids	N/A	
Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	
Module with test	Lab Work	1610DD202B
Assessment objectives/criteria	The student is able to • design and execute experiments • make a test report	
Details of assessments	Andere wijze without test session	Assignment
Permitted Aids	N/A	
Work methods and educational activities	Practical	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	
Module with test	Labview	1610DD202C

Assessment objectives/criteria	The student can: • Identify and describe the elements making up computer-based data acquisition systems, including alternative configurations and technologies • Design a data acquisition system for a given application by analyzing and specifying requirements, selecting appropriate commercial hardware, and writing a computer program to acquire, analyze, and present the desired data	
Details of assessments	Andere wijze without test session	Assignments
Permitted Aids	N/A	
Work methods and educational activities	Workshops	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Flight Dynamics 2 [1610DD203Z]

Academic year	Term	Name of examination component	Study load in credits
3	semester 2	Flight Dynamics 2	3

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Flight Dynamics 2 [1610DD203A]	100%	Cijfer (10 t/m 100)	55	56
Flight Simulator [1610DD203B]	0%	Voldoende / Onvoldoende	V	28

Content of unit of study	Flight Dynamics Simulation assignment

Learning outcomes	BoKS 3: Aerodynamics & Flight Mechanics
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Flight Dynamics 2	1610DD203A
Assessment objectives/criteria	The student is able to: • Sketch of the derivation of the three dimensional representation of the equations of motion for an aircraft • Carry out a linearization on parts of the 3D aircraft equations of motion and to explain the physics behind selected aerodynamic stability derivatives • Simplify the 4x4 symmetric linearised equations to the approximations for the long period and the short period • Simplify the 4x4 asymmetric linearised equations to the approximations for damped rolling, the spiral and the Dutch roll • Carry out damping and frequency characteristics for the aircraft characteristic motions	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	Standard non-programmable calculator	
Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Module with test	Flight Simulator	1610DD203B
Assessment objectives/criteria	The student is able to explain and model aircraft motion quantitatively after disturbing a steady flight.	
Details of assessments	Andere wijze without test session	Experiment assignment Report
Permitted Aids	N/A	
Work methods and educational activities	Practical Simulation experiment	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Design, Build, Test project 3.1 [1619DBTPRZ]

Academic year	Term	Name of examination component	Study load in credits
3	semester 2	Design, Build, Test project 3.1	12

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Design, Build, Test project 3.1 [1619DBTPRA]	100%	Cijfer (10 t/m 100)	55	336

Content of unit of study	Within Project 3.1 the focus lies on self chosen subject being (Performance, Smart Systems,Structures or Manufacturing) at level 3
Learning outcomes	Competence 1. Analysis Competence 2. Design Competence 3. Realisation Competence 5. Management Competence 6. Advice

	Competence 7. Research Competence 8. Professionalisation
Requirements for participation in units of study (See also article 31a TER)	Projects of year 1 and 2 have to be finished before participating in the projects of year 3.
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Design, Build, Test project 3.1	1619DBTPRA
Assessment objectives/criteria	Competence 1. Analysis Competence 2. Design Competence 3. Realisation Competence 5. Management Competence 6. Advice Competence 7. Research Competence 8. Professionalisation	
Details of assessments	without test session	Project dossier Written without test session
Permitted Aids	N/A	
Work methods and educational activities	Project meetings, workshops, reviews, Supervision, PDR/CDR	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Ja	Presence is required for achieving the competences and for the individual assessment.

Aerodynamic Design [1610DD301Z]

Academic year	Term	Name of examination component	Study load in credits
4	semester 1	Aerodynamic Design	5

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Aerodynamic Design Exam [1610DD301A]	60%	Cijfer (10 t/m 100)	55	84
Aerodynamic Design Assignment [1610DD301B]	40%	Cijfer (10 t/m 100)	55	56

Content of unit of study	Aerodynamic Design using modern CFD methods
Learning outcomes	BoKS 3: Aerodynamics & Flight Mechanics
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Aerodynamic Design Exam	1610DD301A
Assessment objectives/criteria	The student is able to • describe and explain the (elements of the) governing equations for fluids. • describe and explain turbulence and its parameters and effects. • describe the most common turbulence modelling methods including its advantages and disadvantages. • describe, explain and apply the numerical methods used in CFD.	

	• describe and explain the (elements of the) verification and validation process in CFD.	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	Standard non-programmable calculator	
Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	
Module with test	Aerodynamic Design Assignment	1610DD301B
Assessment objectives/criteria	The student is able to • work with a commercial CFD package. • set up and perform a CFD simulation correctly. • report and document a CFD simulation according to guidelines used in the industry.	
Details of assessments	Andere wijze without test session	Assignment
Permitted Aids	N/A	
Work methods and educational activities	Workshops	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Control Systems Design [1612DD302Z]

Academic year	Term	Name of examination component	Study load in credits
4	semester 1	Control Systems Design	5

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Control Theory Exam [1612DD302A]	100%	GRD (1 t/m 100)	55	84
Control Theory Assignment [1612DD302B]	0%	Voldoende / Onvoldoende	V	56

Content of unit of study	Understanding of: • the concept of steady state error • the principles of sketching root locus plots
Learning outcomes	BoKS 5: Electronics, Systems & Control
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Control Theory Exam	1612DD302A
Assessment objectives/criteria	The student is able to • Determine steady state errors for different input signals and transfer functions • Sketch root locus plots for different transfer functions • Design simple controllers using the root locus design method	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	Standard non-programmable calculator	
Work methods and educational activities	Lectures	

Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	
Module with test	Control Theory Assignment	1612DD302B
Assessment objectives/criteria	The student is able to: • Calculate steady state errors for different input signals and transfer functions; • Sketch root locus plots of different transfer functions; • Design simple controllers using the root locus design method	
Details of assessments	Andere wijze without test session	New assignment every week to solve during the instruction classes. Work in pairs is preferred. Problem to solve in final week regard all subjects previously discussed / dealt with. Lecturer will notify if participation is unsatisfactory. Exclusion is possible in case participant outcome is still unsufficient the week thereafter. No grade. Just sufficient or not.
Permitted Aids	Open book, so internet etc. can be consulted.	
Work methods and educational activities	Tutorials	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Space Propulsion [1622SE102Z]

Academic year	Term	Name of examination component	Study load in credits
4	semester 1	Space Propulsion	3

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Space Propulsion [1622SE102A]	100%	Cijfer (10 t/m 100)	55	84

Content of unit of study	Space Propulsion
Learning outcomes	BoKS 4: Thermodynamics & Propulsion
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Space Propulsion	1622SE102A
Assessment objectives/criteria	The student shall be able to: • describe the basic characteristics of solid and liquid propellants, the build-up of propulsion systems and most important performance parameters of rocket engines, and be able to calculate chemical rocket engine performance parameters. • be able to describe the build-up of launch vehicles, and launch sequence, and able to calculate the burn-out velocities of single and multi-stage rockets. • become an advanced user of a computer tool for simulations of rocket engines.	
Details of assessments	Schriftelijk without test session	Assignment
Permitted Aids	N/A	
Work methods and educational activities	Lectures	
Contact hours for strategies and teaching		

activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Helicopters [1610DD304Z]

Academic year	Term	Name of examination component	Study load in credits
4	semester 1	Helicopters	2

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Helicopters [1610DD304A]	100%	Cijfer (10 t/m 100)	55	56

Content of unit of study	Helicopters
Learning outcomes	BoKS 3: Aerodynamics & Flight Mechanics
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Helicopters	1610DD304A
Assessment objectives/criteria	The student is able to • describe the general characteristics of helicopters. • identify and describe aerodynamic and stability and control components of helicopters.	

	• calculate the performance of helicopters. • analyse, verify and validate helicopter performance calculations.	
Details of assessments	Schriftelijk without test session	Report
Permitted Aids	N/A	
Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Engineering Entrepreneurship Project [1612AE401Z]

Academic year	Term	Name of examination component	Study load in credits
4	semester 1	Engineering Entrepreneurship Project	15

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Research proposal [1612AE401A]	0%	Voldoende / Onvoldoende	V	42
Technical Feasibility [1612AE401B]	70%	Cijfer (10 t/m 100)	55	250
Business Feasibility [1612AE401C]	30%	Cijfer (10 t/m 100)	55	126
Personal Feasibility [1612AE401D]	0%	Voldoende / Onvoldoende	V	2

Content of unit of study	Each team is obliged to start this program with a self-chosen technology. This self-chosen technology has to be realistic, entrepreneurial and

	represent who you are as a team. The following requirement could be used to assess which idea is a strong starting point: • You have to be able to design and build (part) of the technology yourself in order to proof technical feasibility (i.e. realistic) by making a prototype. • The technology has to be accomplished with an implementation strategy, (i.e. entrepreneurial); • The technology has to fit your passions and interests as a team (i.e. passionate). You will test / validate the technological and market feasibility of your idea, and finally pitch this idea to an external jury.
Learning outcomes	Competence 1. Analysis Competence 2. Design Competence 3. Realisation Competence 4. Control Competence 5. Management Competence 6. Advice Competence 7. Research Competence 8. Professionalisation
Requirements for participation in units of study (See also article 31a TER)	Projects of year 1 and 2 have to be finished before participating in the projects of year 4.
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Research proposal	1612AE401A
Assessment objectives/criteria	Formulate the main research question and sub questions for the technical feasibility study.	
Details of assessments	Schriftelijk	Assignment

	without test session	
Permitted Aids	N/A	
Work methods and educational activities	Tutorial	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	
Module with test	Technical Feasibility	1612AE401B
Assessment objectives/criteria	This report should be a technical report in which you explain in detail all the technological aspects. Your idea: Value Proposition What is the idea and the technology that forms the basis of your Business feasibility plan? This should include: • Vision: Which problem are you going to solve? • Mission: Why and How are you going to solve this problem? • Ambition: What are your goals? What do you want to achieve?	
Details of assessments	without test session	Technical report
Permitted Aids	N/A	
Work methods and educational activities	Project	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	
Module with test	Business Feasibility	1612AE401C
Assessment objectives/criteria	The second part explains several practical tools that will help you work out a business plan for implementation of your idea for a product or service. To goal is to gain insight in the many different aspects that influence your business idea. For this report you have to use the Business Model Canvas of Alexander Osterwalder.	
Details of assessments	without test session	Business feasibility report
Permitted Aids	N/A	

Work methods and educational activities	Workshops / masterclasses	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	
Module with test	Personal Feasibility	1612AE401D
Assessment objectives/criteria	For the third part you will give a personal pitch. For this pitch you have to answer the question 'why should we hire you'? To answer this question you use the insights (self-reflection) that you have gathered about yourself during this project and in the other four years of this educational program.	
Details of assessments	Andere wijze without test session	Presentation
Permitted Aids	N/A	
Work methods and educational activities	Project	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Project 1 [1610GT102Z]

Academic year	Term	Name of examination component	Study load in credits
4	blok 1	Project 1	5

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Project 1 [1610GT102A]	100%	Cijfer (10 t/m 100)	55	140

Content of unit of study	Project 1

Learning outcomes	Competence 1. Analysis Competence 2. Design Competence 5. Management Competence 7. Research Competence 8. Professionalisation
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Project 1	1610GT102A
Assessment objectives/criteria	Competence 1. Analysis Competence 2. Design Competence 5. Management Competence 7. Research Competence 8. Professionalisation	
Details of assessments	without test session	Report + presentation
Permitted Aids	N/A	
Work methods and educational activities	Kick – off lecture Once per 2 weeks a meeting with supervisor	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Ja	Presence is required for achieving the competences.

Gas Turbine Materials and Maintenance [1619GT101Z]

Academic year	Term	Name of examination component	Study load in credits
4	blok 1	Gas Turbine Materials and Maintenance	4

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Gas Turbine Materials [1619GT101A]	50%	Cijfer (10 t/m 100)	55	56
Gas Turbine Maintenance [1619GT101B]	50%	Cijfer (10 t/m 100)	55	56

Content of unit of study	Gas Turbine Materials Gas Turbine Maintenance
Learning outcomes	BoKS 6: Materials & Manufacturing BoKS 7: Business, Airworthiness & Operations
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Gas Turbine Materials	1619GT101A
Assessment objectives/criteria	The student: • Knows the basic loads on gas turbine components and materials	

	• Knows the main physical and mechanical properties of gas turbine materials • Has knowledge about alloy materials and their microstructure • Understands phase diagrams of alloys • Knows about production processes of alloys and crystals • Knows how to manufacture components for use in gas turbines • Knows how to protect gas turbine components in high temperature zones • Knows how to inspect gas turbine parts • Can discuss about the inspection and repair of gas turbine components	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	N/A	
Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	
Module with test	Gas Turbine Maintenance	1619GT101B
Assessment objectives/criteria	The student • Knows the techniques in maintenance, repair and overhaul of gas turbine engines • Understands the laws and regulations regarding gas turbine maintenance • Understands the purpose of thermal coatings and application of such coating to gas turbine components • Has insight in the human factors playing a role in maintenance	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	N/A	
Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		

Compulsory attendance (See also Article 115 TER)	Nee	

Gas Turbine Theory [1619GT103Z]

Academic year	Term	Name of examination component	Study load in credits
4	blok 1	Gas Turbine Theory	2

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Gas Turbine Theory [1619GT103A]	100%	Cijfer (10 t/m 100)	55	56

Content of unit of study	Thermodynamic fundamentals of gas turbines
Learning outcomes	BoKS 4: Thermodynamics & Propulsion
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Gas Turbine Theory	1619GT103A
Assessment objectives/criteria	The student • can calculate the thrust, propulsive efficiency and power output of a gas turbine based on the performance parameters of the engine	

	• can calculate the performance parameters of different variations of the Joule-Brayton cycle (e.g. turbojet, turbofan, turboshaft) • can calculate the combustion performance parameters of a gas turbine (e.g. FAR, AFR, and fuel consumption) • understands the concept of total properties and can explain the difference between a choked and un-choked nozzle • can identify and explain the principles of operation of different gas turbine configurations: single spool engines, twin spools engines, afterburner, intercooler, and preheater • apply various control philosophies through mathematical experiments	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	Standard non-programmable calculator	
Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Combustion & Emissions [1619GT104Z]

Academic year	Term	Name of examination component	Study load in credits
4	blok 1	Combustion & Emissions	2

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Combustion & Emissions [1619GT104A]	100%	Cijfer (10 t/m 100)	55	56

Content of unit of study	Combustion and emissions of gas turbines
Learning outcomes	BoKS 4: Thermodynamics & Propulsion

Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Combustion & Emissions	1619GT104A
Assessment objectives/criteria	The student • Knows how gas turbines produce emissions, know what influence these emissions have on the environment and how to reduce the emissions before, during or after the formation • Understands the legislation and regulations regarding gas turbine emissions • Assesses whether a gas turbine achieves the emission performance and know how to correct any problems	
Details of assessments	Andere wijze without test session	Assignments
Permitted Aids	N/A	
Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Gas Turbine Technology Trends 1 [1619GT105Z]

Academic year	Term	Name of examination component	Study load in credits
4	blok 1	Gas Turbine Technology Trends 1	2

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Guest Lectures and Company Visits 1 [1619GT105A]	100%	Voldoende / Onvoldoende	V	56

Content of unit of study	Guest lectures and company visits
Learning outcomes	BoKS 4: Thermodynamics & Propulsion
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Guest Lectures and Company Visits 1	1619GT105A
Assessment objectives/criteria	The student • Gets an insight into the gas turbine industry in The Netherlands • Sees how the theory of the lecture series is put into practice • Learns from real life practice in a company	
Details of assessments	Andere wijze without test session	Report
Permitted Aids	N/A	

Work methods and educational activities	Guest lectures Company visits	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Ja	Presence is required for achieving the competences

Project 2 [1610GT205Z]

Academic year	Term	Name of examination component	Study load in credits
4	blok 2	Project 2	5

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Project 2 [1610GT205A]	100%	Cijfer (10 t/m 100)	55	140

Content of unit of study	Project 2
Learning outcomes	Competence 1. Analysis Competence 2. Design Competence 5. Management Competence 7. Research Competence 8. Professionalisation
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No

Specific details	None

Module with test	Project 2	1610GT205A
Assessment objectives/criteria	Competence 1. Analysis Competence 2. Design Competence 5. Management Competence 7. Research Competence 8. Professionalisation	
Details of assessments	without test session	Report + presentation
Permitted Aids	N/A	
Work methods and educational activities	Once per 2 weeks a meeting with project supervisor	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Ja	Presence is required for achieving the competences.

Gas Turbine Performance & Simulation [1619GT201Z]

Academic year	Term	Name of examination component	Study load in credits
4	blok 2	Gas Turbine Performance & Simulation	5

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Gas Turbine Performance [1619GT201A]	60%	Cijfer (10 t/m 100)	55	80
Gas Turbine Simulation [1619GT201B]	40%	Cijfer (10 t/m 100)	55	60

Content of unit of study	Gas Turbine Performance

	Prediction of the performance parameters of gas turbines during design and off-design operating conditions. Introduction to the topic of turbomachinery design. Gas Turbine Simulation Application of numerical methods to solve gas turbine design, performance and optimization (static) problems. The student will apply these techniques by using software.
Learning outcomes	BoKS 4: Thermodynamics & Propulsion
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Gas Turbine Performance	1619GT201A
Assessment objectives/criteria	The student can • Calculate the performance parameters (thrust/power, exhaust temperature, pressure ratios, etc.) of a gas turbine under different environmental and loading conditions. Conditions include varying ambient temperature, pressure and humidity levels. This is called off design calculations. • Calculate the performance of the gas turbine when power augmentation techniques are used (Inlet air chilling, steam and water injection). • Estimate the blade angles, dimensions and number of stages of compressors and turbines. • Interpret compressor and turbine maps. • Discuss gas turbine control philosophies.	
Details of assessments	Schriftelijk without test session	Assignments

Permitted Aids	N/A	
Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	
Module with test	Gas Turbine Simulation	1619GT201B
Assessment objectives/criteria	The student can • Understand the difference between different simulation paradigms: static, dynamic, micro, macro. • Use software to design and optimize a gas turbine cycle • Use software to perform basic sizing of gas turbine components • Use software to calculate the performance of a gas turbine under different loads and ambient conditions • Discuss convergence methods for gas turbine off-design problems • Use numerical optimisation techniques to further optimise the performance of a gas turbine	
Details of assessments	Andere wijze without test session	Assignments
Permitted Aids	N/A	
Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Gas Turbine Technology Trends 2 [1619GT202Z]

Academic year	Term	Name of examination component	Study load in credits

4	blok 2	Gas Turbine Technology Trends 2	2

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Guest Lectures and Company Visits 2 [1619GT202A]	100%	Voldoende / Onvoldoende	V	56

Content of unit of study	Guest lectures and company visits
Learning outcomes	BoKS 4: Thermodynamics & Propulsion
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Guest Lectures and Company Visits 2	1619GT202A
Assessment objectives/criteria	The student • Gets an insight into the gas turbine industry in The Netherlands • Sees how the theory of the lecture series is put into practice • Learns from real life practice in a company	
Details of assessments	Andere wijze without test session	Assignment
Permitted Aids	N/A	
Work methods and educational activities	Guest lectures Company visits	

Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Ja	Presence is required for achieving the competences

Gas Turbine Industrial Applications [1619GT203Z]

Academic year	Term	Name of examination component	Study load in credits
4	blok 2	Gas Turbine Industrial Applications	3

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Industrial Gas Turbines [1619GT203A]	60%	Cijfer (10 t/m 100)	55	48
Gas Turbine Auxiliaries [1619GT203B]	40%	Cijfer (10 t/m 100)	55	36

Content of unit of study	Industrial Gas Turbines Use of gas turbine engines as mechanical drivers for industrial applications and, in particular, for electric power generation (combined cycles). Gas Turbine Auxiliaries Purpose, design and function of the following gas turbine sub-systems: start-up, electric, lubrication oil, fuel, gearboxes, actuators and control systems.
Learning outcomes	BoKS 4: Thermodynamics & Propulsion
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No

Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Industrial Gas Turbines	1619GT203A
Assessment objectives/criteria	The student can • Calculate the main performance parameters of a combined cycle plant: output power, cycle efficiency, fuel consumption, etc. • Discuss different types of turbines used for stationary applications: Industrial and Aeroderivative. • Recognise and discuss the main components and functionality of the stationary gas turbine package. • Understand the matching procedure between a gas turbine and a mechanical load. • Read and interpret a process flow diagram (PFD). • Discuss common technical problems/issues and troubleshooting techniques for stationary gas turbines.	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	Standard non-programmable calculator	
Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	
Module with test	Gas Turbine Auxiliaries	1619GT203B
Assessment objectives/criteria	The student can • List and describe in detail the characteristics and function of different gas turbine auxiliary systems: 1. Start system	

	2. Hydraulic systems 3. Lubrication oil systems 4. Fuel systems 5. Electric systems • List and describe the instrumentation surrounding a gas turbine • Describe gas turbine start-up and shut down procedures • Describe common gas turbine control strategies • Describe common problems occurring in auxiliary systems and basic troubleshooting strategies	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	Standard non-programmable calculator	
Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Aircraft Structures 2 [1615AE101Z]

Academic year	Term	Name of examination component	Study load in credits
3	semester 2	Aircraft Structures 2	3

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Aircraft Structures 2 [1615AE101A]	100%	Cijfer (10 t/m 100)	55	84

Content of unit of study	Stability of thin-walled structures like stiffened panels, columns and beams, loaded by a compression and/or shear load.
Learning outcomes	BoKS 2: Structures & Mechanics

	BoKS 6: Materials & Manufacturing
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Aircraft Structures 2	1615AE101A
Assessment objectives/criteria	The student is able to: • Explain which areas in the structure of an aircraft fuselage / wing are critical for stability • Explain the principles and failure criteria in relation to instability of thin-walled structures • Determine (by means of calculations) the critical buckling failure loads and failure modes for columns loaded by a constant compression load (inclusive post-buckling behaviour) • Determine (by means of calculations) the critical buckling failure loads and failure modes for thin-walled stiffened panels loaded by a constant compression load (inclusive post-buckling behaviour) • Determine (by means of calculations) the critical buckling failure loads and failure modes for thin-walled stiffened beams loaded by a constant shear load (inclusive post-buckling behaviour) • Determine the effect of different materials, material limitations (inelasticity effects), geometrical limitations and initial imperfections (tolerances) on buckling failure loads of stiffened panels and beams	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	Standard non-programmable calculator	
Work methods and educational activities	Lectures and tutorials	

Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Advanced CAD [1621AE102Z]

Academic year	Term	Name of examination component	Study load in credits
3	semester 2	Advanced CAD	1

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Advanced CAD [1621AE102A]	100%	Cijfer (10 t/m 100)	55	28

Content of unit of study	
Learning outcomes	
Requirements for participation in units of study (See also article 31a TER)	
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	

Module with test	Advanced CAD	1621AE102A
Assessment objectives/criteria		

Details of assessments	Andere wijze without test session	
Permitted Aids		
Work methods and educational activities		
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Business Administration [1612AE103Z]

Academic year	Term	Name of examination component	Study load in credits
3	semester 2	Business Administration	2

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Business Administration [1612AE103A]	100%	Cijfer (10 t/m 100)	55	56

Content of unit of study	Business Administration
Learning outcomes	BoKS 7: Business, Airworthiness & Operations
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No

Specific details	None

Module with test	Business Administration	1612AE103A
Assessment objectives/criteria	The student is able to: • Communicate effectively in formal situations, • Estimate costs, do cost calculations and determine selling strategy, • Take business and financial aspects into account, • Define and evaluate a simple aircraft supply chain • Understand the basics of airline operations	
Details of assessments	Andere wijze without test session	Assignments
Permitted Aids	N/A	
Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

FEM [1619LS104Z]

Academic year	Term	Name of examination component	Study load in credits
3	semester 2	FEM	3

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Mechanics 7 [1610LS104A]	100%	Cijfer (10 t/m 100)	55	28
FEM/Nastran [1610LS104B]	0%	Voldoende / Onvoldoende	V	28

Practical Strain Structures [1610LS104C]	0%	Voldoende / Onvoldoende	V	28

Content of unit of study	• Mechanics 7: Mechanics of Materials (asymmetric bending, deflections, statically indeterminate structures) • FEM/Nastran: Introduction Patran/Nastran in combination with application of theory Mechanics of Materials year 2/3 in different FEM-Mechanics assignments • Practical Strain Structures: illustration of Aircraft Structures 2 (Stability of thin-walled structures) theory in a compression test in a test-bench
Learning outcomes	BoKS 2: Structures & Mechanics BoKS 6: Materials & Manufacturing BoKS 9: Professionalising
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Mechanics 7	1610LS104A
Assessment objectives/criteria	The student can • Calculate normal stresses in beams with asymmetric cross-sectional area; • Apply the reduced moment area method for the deflection of beams for statically determinate structures; • Apply the reduced moment area method for the deflection of beams for statically indeterminate structures.	

Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	Standard non-programmable calculator	
Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	
Module with test	FEM/Nastran	1610LS104B
Assessment objectives/criteria	Students will be able to: • understand the basics of Static Finite Element Analysis using Patran/Nastran • make, verify and execute a Nastran input file with help of Patran • make a simple model of a real beam and plate structure • make a mesh transition and/or refined meshing in a FEM model • extract stresses and displacements from a model. • verify model results with simple analyses • explain the pitfalls and short comings of FEM	
Details of assessments	Andere wijze without test session	Assignments
Permitted Aids	N/A	
Work methods and educational activities	Tutorials	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	
Module with test	Practical Strain Structures	1610LS104C
Assessment objectives/criteria	The student is able to: • Work with strain gauges and measuring equipment • Perform a test on an actual construction part	

	• Evaluate results and interpret them • Make a link between practice and theoretical analysis • Report the results	
Details of assessments	Andere wijze without test session	Report
Permitted Aids	N/A	
Work methods and educational activities	Practical	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Quality Management [1610AE201Z]

Academic year	Term	Name of examination component	Study load in credits
3	semester 2	Quality Management	2

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Quality Management [1610AE201A]	100%	Cijfer (10 t/m 100)	55	56

Content of unit of study	Quality Management
Learning outcomes	BoKS 6: Materials & Manufacturing BoKS 7: Business, Airworthiness & Operations
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No

Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Quality Management	1610AE201A
Assessment objectives/criteria	After this course the student: • Has knowledge of the background and the fundamentals of Quality Management • Can name the 3 pillars of QM and the 8 principles of QM • Can tell (in own words) the activities during the QP, QC and QI phase • Can distinguish the differences and similarities between the ISO approach and the process approach to Quality management.	
Details of assessments	Andere wijze without test session	Assignments
Permitted Aids	N/A	
Work methods and educational activities	Tutorials	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Ja	80% presence is required. If not, in consultation with the lecturer, the student can hand in a supplementary assignment.

Composites Laminate Theory [1610LS202Z]

Academic year	**Term**	**Name of examination component**	**Study load in credits**
3	semester 2	Composites Laminate Theory	3

Module name and code	**Weighting factor**	**Assessment scale**	**Required minimum score**	**Number of study hours**

Laminate Theory [1610LS202A]	80%	Cijfer (10 t/m 100)	55	70
Practical Laminate Theory [1610LS202B]	20%	Cijfer (10 t/m 100)	55	14

Content of unit of study	Laminate theory (course) Practical laminate theory
Learning outcomes	BoKS 2: Structures & Mechanics BoKS 6: Materials & Manufacturing
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Laminate Theory	1610LS202A
Assessment objectives/criteria	The student • Can analyse stiffness for a laminate • Can analyse strength in fibres and resins • Can identify and analyse failure modes for laminates • Can Read and interpret output of lamination analysis tools • Knows the restrictions and validity of the laminate theory • Can apply laminate theory in hand calculations for shells and sandwich	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	Standard non-programmable calculator	

Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	
Module with test	Practical Laminate Theory	1610LS202B
Assessment objectives/criteria	The student is able to: • design, build and test solid and sandwich laminates subjected to different types of loading and requirements • predict strength and stiffness properties of laminates to be tested • evaluate test results of tested laminates • recommend improvements w.r.t. test setup, test procedure and lay-up laminates • document the design, build and test of all laminates in a technical report • reflect on his/her performance w.r.t. practical (preparation, execution, evaluation of executed tests)	
Details of assessments	Schriftelijk without test session	Report
Permitted Aids	N/A	
Work methods and educational activities	Practical	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Ja	Attendance required because of execution of practical

Structural Optimisation [1619LS203Z]

Academic year	Term	Name of examination component	Study load in credits
3	semester 2	Structural Optimisation	4

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Structural Optimisation [1610LS203A]	50%	Cijfer (10 t/m 100)	55	56
Materials Selection [1610LS203B]	0%	Voldoende / Onvoldoende	V	28
Mechanical Joints [1610LS203C]	50%	Cijfer (10 t/m 100)	55	28

Content of unit of study	The unit Structural Optimisation covers 3 areas: 1. Structural Optimisation: geometrical optimising of thin-walled stiffened panels and beams being part of a wing or fuselage cross-section and subjected to tensile, compressive and/or shear loads 2. Materials Selection: selection procedures to select the optimum material for application in aircraft structures, taking into account a list of requirements for selection processes 3. Mechanical Joints: design and analysis of fastened and/or bonded joints in aircraft structures
Learning outcomes	BoKS 1: Mathematics BoKS 2: Structures & Mechanics BoKS 6: Materials & Manufacturing BoKS 9: Professionalising
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Structural Optimisation	1610LS203A
Assessment objectives/criteria	The student is able to: • Explain the basic theory of optimisation in the design process of thin-walled stiffened panels and beams as part of a box-structure (e.g. wing-box) • Identify design parameters, design variables, boundary conditions and design objectives in the optimization process being part of a design loop of a structural component • Solve a structural optimisation problem with help of software (e.g. Excel, Matlab, MathCad) • Evaluate the influence of design variables and boundary conditions on the results of the optimisation process • Advise on further improvements for a next step optimisation loop in a design process of a structural component	
Details of assessments	Schriftelijk without test session	Assignment
Permitted Aids	N/A	
Work methods and educational activities	Lectures and tutorials	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	
Module with test	Materials Selection	1610LS203B
Assessment objectives/criteria	The student can • Define requirements for new type of application • Select optimal material based on requirements and objective • Derive the formulas for finding optimal ratios of material properties, also taking into account the geometry for use material databases • Find materials with optimal ratio of parameters with the use of material databases • Select manufacturing method for product • Select compatible materials for tooling and moulds • Combine many choices in morphological chart	
Details of assessments	Schriftelijk	Assigments

	without test session	
Permitted Aids	N/A	
Work methods and educational activities	Lectures / workshops	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	
Module with test	Mechanical Joints	1610LS203C
Assessment objectives/criteria	The student can • identify loadpaths in real structures • identify failure modes • perform handwritten stress-analysis in conceptual design • prove the strength of a structure based on evidence data, tests and logical reasoning • design joints and structures • perform reproducible and reliable analyses • make a professional stress report	
Details of assessments	Schriftelijk without test session	Assignments with preview and review
Permitted Aids	N/A	
Work methods and educational activities	Tutorials	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Design, Build, Test project 3.1 [1619DBTPRZ]

Academic year	Term	Name of examination component	Study load in credits

3	semester 2	Design, Build, Test project 3.1	12

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Design, Build, Test project 3.1 [1619DBTPRA]	100%	Cijfer (10 t/m 100)	55	336

Content of unit of study	Within Project 3.1 the focus lies on self chosen subject being (Performance, Smart Systems,Structures or Manufacturing) at level 3
Learning outcomes	Competence 1. Analysis Competence 2. Design Competence 3. Realisation Competence 5. Management Competence 6. Advice Competence 7. Research Competence 8. Professionalisation
Requirements for participation in units of study (See also article 31a TER)	Projects of year 1 and 2 have to be finished before participating in the projects of year 3.
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Design, Build, Test project 3.1	1619DBTPRA
Assessment objectives/criteria	Competence 1. Analysis Competence 2. Design Competence 3. Realisation Competence 5. Management Competence 6. Advice	

	Competence 7. Research Competence 8. Professionalisation	
Details of assessments	without test session	Project dossier Written without test session
Permitted Aids	N/A	
Work methods and educational activities	Project meetings, workshops, reviews, Supervision, PDR/CDR	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Ja	Presence is required for achieving the competences and for the individual assessment.

Aircraft Structures 3 [1615LS301Z]

Academic year	Term	Name of examination component	Study load in credits
4	semester 1	Aircraft Structures 3	5

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Aircraft Structures 3 [1615LS301A]	100%	Cijfer (10 t/m 100)	55	98
FEM Assignment [1615LS301B]	0%	Voldoende / Onvoldoende	V	42

Content of unit of study	Aircraft Structures FEM assignment
Learning outcomes	BoKS 2: Structures & Mechanics
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase

Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Aircraft Structures 3	1615LS301A
Assessment objectives/criteria	The student can • Calculate shear flows and normal forces in open and closed multi-cell cross-sections for an idealized wing or an idealized fuselage; • Calculate shear flows and normal forces in idealized wing ribs or idealized fuselage frames; • Calculate shear flows and normal forces in an idealized wing box or an idealized fuselage with a cut-out.	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	Standard non-programmable calculator	
Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	
Module with test	FEM Assignment	1615LS301B
Assessment objectives/criteria	The student is able to: • Create, run and analyse different FEModels with help of Patran/Nastran and using different types of elements (beam, rod, membrane, shear, shell elements) • Interpretate and correct typical analysis warnings and failure messages from Patran/Nastran • Correlate theory and practice in FEM analyses w.r.t. strength and stiffness of simplified structures	

	• Perform important quality checks to validate FEM results (hand calculations, equilibrium checks, free bodies, deformation checks, checks of log files processing results) • Present FEModels and results in a stress report	
Details of assessments	Andere wijze without test session	Report
Permitted Aids	N/A	
Work methods and educational activities	Lectures & Workshops	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Vibrations [1610LS302Z]

Academic year	**Term**	**Name of examination component**	**Study load in credits**
4	semester 1	Vibrations	3

Module name and code	**Weighting factor**	**Assessment scale**	**Required minimum score**	**Number of study hours**
Vibrations [1610LS302A]	100%	Cijfer (10 t/m 100)	55	84

Content of unit of study	Vibrations Introduction to vibrations. Recognising difference between forced and free vibrations; critically damped, underdamped and overdamped systems. Impact of vibrations on aircraft design.
Learning outcomes	BoKS 2: Stuctures & Mechanics BoKS 1: Mathematics
Requirements for participation in units of study (See also article 31a TER)	None

Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Vibrations	1610LS302A
Assessment objectives/criteria	The student • knows introductory vibrations terminology and notations • can model and analyse free vibrations of damped and undamped 1-DOF systems; • can model and analyse forced vibrations of damped and undamped 1-DOF systems; • can model and analyse free vibrations of undamped 2-DOF systems. • can model and analyse forced vibrations of undamped 2-DOF systems.	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	Standard non-programmable calculator	
Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Fatigue [1614LS303Z]

Academic year	Term	Name of examination component	Study load in credits
4	semester 1	Fatigue	2

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Fatigue [1614LS303A]	100%	Cijfer (10 t/m 100)	55	56

Content of unit of study	Introduction to fatigue
Learning outcomes	BoKS 2: Structures & Mechanics BoKS 6: Materials & Manufacturing
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Fatigue	1614LS303A
Assessment objectives/criteria	The student is able to: • explain the theoretical model for fatigue analysis. He is aware of the surface effects like stress concentrations, residual stresses and surface irregularities that endurance of material life. • explain the theoretical model for crackgrowth. He knows the factors (like cracklength and stress intensity) influencing the crackgrowth speed. • explain which loads and conditions are be applied for testing. • explain which measures shall be taken to enhance the endurance of a design. He can improve a design for fatigue and crackgrowth. • use a typical life prediction tool as being used for verification of fatigue and crackgrowth analysis.	
Details of assessments	Andere wijze without test session	Assignment
Permitted Aids	Ruler, standard non-programmable calculator.	

	Open book: prof Jaap Schijve, Fatigue of structures and materials	
Work methods and educational activities	Lecture + guest lectures	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Composites 2 [1610LS304Z]

Academic year	Term	Name of examination component	Study load in credits
4	semester 1	Composites 2	5

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Composites 2 [1610LS304A]	100%	Cijfer (10 t/m 100)	55	84
Composites Practical [1610LS304B]	0%	Voldoende / Onvoldoende	V	56

Content of unit of study	Composites 2: is follow up of Composites 1 and Laminate Theory (year 2/3) covering different topics with more focus on the fundamentals. The lectures cover a range of topics that are outcomes of the research carried out within Inholland Composites. Practical: combination of design, manufacturing and testing composite test specimens in relation to course Composites 2. There will be the possibilities of excursions and guest lectures to demonstrate practical applications within companies.
Learning outcomes	BoKS 2: Structures & Mechanics BoKS 6: Materials & Manufacturing BoKS 8: Research & Design BoKS 9: Professionalising

Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Composites 2	1610LS304A
Assessment objectives/criteria	The student • shows how to select the right fibre and matrices combination based on an application or set of requirements; • knows quality methods and checks used within composite industry; • shows how to design, verify and realize a composite (repaired) structure; • knows different repair methods; • show how to set-up a test plan for composite structures bases on acquired knowledge of test sequences; • knows different test methods and possible outcomes; • describes and discusses composite applications and its innovative design methods; • knows different design methodologies; • shows how to design a composite repair and discusses the variables within this design.	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	Standard non-programmable calculator	
Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		

Compulsory attendance (See also Article 115 TER)	Nee	
Module with test	Composites Practical	1610LS304B
Assessment objectives/criteria	The student is able to: • execute and evaluate a production plan; • execute and evaluate damage assessment; • execute and evaluate a design plan for a composite repair; • execute and evaluate a composite repair; • execute and evaluate a test program.	
Details of assessments	Andere wijze without test session	Report / Presentation (oral)
Permitted Aids	N/A	
Work methods and educational activities	Workshop/practical and excursion	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Ja	Attendance required because of execution of practical.

Engineering Entrepreneurship Project [1612AE401Z]

Academic year	Term	Name of examination component	Study load in credits
4	semester 1	Engineering Entrepreneurship Project	15

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Research proposal [1612AE401A]	0%	Voldoende / Onvoldoende	V	42

Technical Feasibility [1612AE401B]	70%	Cijfer (10 t/m 100)	55	250
Business Feasibility [1612AE401C]	30%	Cijfer (10 t/m 100)	55	126
Personal Feasibility [1612AE401D]	0%	Voldoende / Onvoldoende	V	2

Content of unit of study	Each team is obliged to start this program with a self-chosen technology. This self-chosen technology has to be realistic, entrepreneurial and represent who you are as a team. The following requirement could be used to assess which idea is a strong starting point: • You have to be able to design and build (part) of the technology yourself in order to proof technical feasibility (i.e. realistic) by making a prototype. • The technology has to be accomplished with an implementation strategy, (i.e. entrepreneurial); • The technology has to fit your passions and interests as a team (i.e. passionate). You will test / validate the technological and market feasibility of your idea, and finally pitch this idea to an external jury.
Learning outcomes	Competence 1. Analysis Competence 2. Design Competence 3. Realisation Competence 4. Control Competence 5. Management Competence 6. Advice Competence 7. Research Competence 8. Professionalisation
Requirements for participation in units of study (See also article 31a TER)	Projects of year 1 and 2 have to be finished before participating in the projects of year 4.
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No

Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Research proposal	1612AE401A
Assessment objectives/criteria	Formulate the main research question and sub questions for the technical feasibility study.	
Details of assessments	Schriftelijk without test session	Assignment
Permitted Aids	N/A	
Work methods and educational activities	Tutorial	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	
Module with test	Technical Feasibility	1612AE401B
Assessment objectives/criteria	This report should be a technical report in which you explain in detail all the technological aspects. Your idea: Value Proposition What is the idea and the technology that forms the basis of your Business feasibility plan? This should include: • Vision: Which problem are you going to solve? • Mission: Why and How are you going to solve this problem? • Ambition: What are your goals? What do you want to achieve?	
Details of assessments	without test session	Technical report
Permitted Aids	N/A	
Work methods and educational activities	Project	
Contact hours for strategies and teaching activities		

Compulsory attendance (See also Article 115 TER)	Nee	
Module with test	Business Feasibility	1612AE401C
Assessment objectives/criteria	The second part explains several practical tools that will help you work out a business plan for implementation of your idea for a product or service. To goal is to gain insight in the many different aspects that influence your business idea. For this report you have to use the Business Model Canvas of Alexander Osterwalder.	
Details of assessments	without test session	Business feasibility report
Permitted Aids	N/A	
Work methods and educational activities	Workshops / masterclasses	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	
Module with test	Personal Feasibility	1612AE401D
Assessment objectives/criteria	For the third part you will give a personal pitch. For this pitch you have to answer the question 'why should we hire you'? To answer this question you use the insights (self-reflection) that you have gathered about yourself during this project and in the other four years of this educational program.	
Details of assessments	Andere wijze without test session	Presentation
Permitted Aids	N/A	
Work methods and educational activities	Project	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Astrodynamics and Orbital Mechanics [1622SE101Z]

Academic year	Term	Name of examination component	Study load in credits
4	blok 1	Astrodynamics and Orbital Mechanics	3

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Astrodynamics and Orbital Mechanics [1622SE101A]	100%	Cijfer (10 t/m 100)	55	84

Content of unit of study	Astrodynamics and Orbital Mechanics
Learning outcomes	BoKS 3: Aerodynamics & Flight Mechanics BoKS 4: Thermodynamics & Propulsion
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Astrodynamics and Orbital Mechanics	1622SE101A
Assessment objectives/criteria	The student shall be able to: • understand and describe the different aspects of the space environment, and the effects of this environment to astronauts and spacecraft, • describe the relationship between mission, orbits, orbit changes and required propellant mass and be able to perform basic orbital mechanics calculations, including transfer orbits. • become an advanced user of a computer tool for simulation of satellite orbits	

Details of assessments	Schriftelijk without test session	Assignment
Permitted Aids	N/A	
Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Space Propulsion [1622SE102Z]

Academic year	Term	Name of examination component	Study load in credits
4	blok 1	Space Propulsion	3

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Space Propulsion [1622SE102A]	100%	Cijfer (10 t/m 100)	55	84

Content of unit of study	Space Propulsion
Learning outcomes	BoKS 4: Thermodynamics & Propulsion
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No

Specific details	None

Module with test	Space Propulsion	1622SE102A
Assessment objectives/criteria	The student shall be able to: • describe the basic characteristics of solid and liquid propellants, the build-up of propulsion systems and most important performance parameters of rocket engines, and be able to calculate chemical rocket engine performance parameters. • be able to describe the build-up of launch vehicles, and launch sequence, and able to calculate the burn-out velocities of single and multi-stage rockets. • become an advanced user of a computer tool for simulations of rocket engines.	
Details of assessments	Schriftelijk without test session	Assignment
Permitted Aids	N/A	
Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Engineering for Space 1 [1622SE103Z]

Academic year	Term	Name of examination component	Study load in credits
4	blok 1	Engineering for Space 1	3

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Engineering for Space 1 [1622SE103A]	100%	Cijfer (10 t/m 100)	55	84

Content of unit of study	Engineering for Space

Learning outcomes	BoKS 2: Structures & Mechanics BoKS 3: Aerodynamics & Flight Mechanics BoKS 5: Electronics, Systems & Control BoKS 6: Materials & Manufacturing BoKS 8: Research & Design
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Engineering for Space 1	1622SE103A
Assessment objectives/criteria	Engineering for Space 1 & 2 contains the following disciplines: 1. Systems Engineering 2. Thermal Engineering 3. Materials & Structures 4. Attitude & Orbit Control Systems For the discipline 'Systems Engineering', the student shall be able to: • describe in technical terms the hardware and software elements that encompass a system that operates in Space. • execute system engineering tasks(produce a Product Breakdown Structure (PBS), Work Breakdown Structure (WBS), system and sub-system trade-off, requirements flow down, requirements verification & validation, review cycle, budgets, Interface Control). • understands the attitude and the role of a systems engineer. • navigate through the ECSS standards • execute a feasibility analysis for a satellite (system or sub-system) concept design For the discipline 'Thermal Engineering', the student shall be able to: • understand the physics of the space environment and its influence on materials and structures	

	• make thermal balance calculations for a space system in orbit • become an advanced user of a computer tool for simulation of thermal behavior of a space system For discipline 'Materials & Structures', the student shall be able to: • understand which, and the reason why, materials (and related processes) are suitable for use in the space environment and where this can be traced back in the ECSS standards • investigate expected failure modes and load cases during several stages of the mission lifetime of a space system • get familiar with types of structures used in space systems and their external and internal interfaces • perform mechanical analyses for a (simple) preliminary design and validate the results using handbooks • understand which Finite Elements Analysis (FEA) methods should be used for a specific design case and what are its limitations in design and validation • understand how the manufacturing and assembly of space systems are executed • understand how the structures of space systems are tested for dynamic and static loads For the discipline 'Attitude & Orbit Control Systems', the student shall be able to: • define the dynamics of a (multi-body) spacecraft and understand its properties (e.g.: moment of inertia 3D I-matrix) and characteristics. • understand the purpose of a spacecraft mission (specification and requirements and accuracy) • understand the physics behind the sensors required to meet the purpose of a spacecraft mission. • understand different control logics needed for the interaction between sensors and actuators within the Attitude and Orbit Control System (AOCS).	
Details of assessments	Schriftelijk without test session	Assignment
Permitted Aids	N/A	
Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Space Project 1 [1622SE104Z]

Academic year	Term	Name of examination component	Study load in credits
4	blok 1	Space Project 1	6

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Space Project 1 [1622SE104A]	100%	Cijfer (10 t/m 100)	55	168

Content of unit of study	Space Project
Learning outcomes	Competence 1. Analysis Competence 2. Design Competence 3. Realisation Competence 4. Control Competence 5. Management Competence 6. Advice Competence 7. Research Competence 8. Professionalisation
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Space Project 1	1622SE104A

Assessment objectives/criteria	Competence 1. Analysis Competence 2. Design Competence 3. Realisation Competence 4. Control Competence 5. Management Competence 6. Advice Competence 7. Research Competence 8. Professionalisation	
Details of assessments	without test session	Project dossier
Permitted Aids	N/A	
Work methods and educational activities	Project meetings, workshops, reviews, (Study) coaching	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Ja	Presence is required for achieving the competences and for the individual assessment.

Space Applications and Mission Analysis [1622SE201Z]

Academic year	**Term**	**Name of examination component**	**Study load in credits**
4	blok 2	Space Applications and Mission Analysis	3

Module name and code	**Weighting factor**	**Assessment scale**	**Required minimum score**	**Number of study hours**
Space Applications and Mission Analysis [1622SE201A]	100%	Cijfer (10 t/m 100)	55	84

Content of unit of study	Space Applications and Mission Analysis
Learning outcomes	BoKS 3: Aerodynamics & Flight Mechanics BoKS 5: Electronics, Systems & Control

	BoKS 7: Business, Airworthiness & Operations
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Space Applications and Mission Analysis	1622SE201A
Assessment objectives/criteria	The student shall be able to: • understand, describe and have the overview of all elements that encompass a space mission for all relevant applications, both in space and on the ground. • work with technical specifications of all systems, subsystems and components involved in a space mission and be able to select suitable hardware and software for a specific mission. • become an expert user of a computer tool for simulation of space missions.	
Details of assessments	Schriftelijk without test session	Assignment
Permitted Aids	N/A	
Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Satellite Instrumentation [1622SE202Z]

Academic year	Term	Name of examination component	Study load in credits
4	blok 2	Satellite Instrumentation	3

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Satellite Instrumentation [1622SE202A]	100%	Cijfer (10 t/m 100)	55	84

Content of unit of study	Satellite Instrumentation
Learning outcomes	BoKS 5: Electronics, Systems & Control BoKS 8: Research & Design
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Satellite Instrumentation	1622SE202A
Assessment objectives/criteria	The student shall be able to: • understand and describe the electromagnetic spectrum and how active and passive instrumentation make use of this for Space missions, • have a basic understanding of the physical processes involved in radiation detection, • have a basic understanding of optical systems	
Details of assessments	Schriftelijk with test session	Exam
Permitted Aids	Standard non-programmable calculator	

Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Engineering for Space 2 [1622SE203Z]

Academic year	Term	Name of examination component	Study load in credits
4	blok 2	Engineering for Space 2	3

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Engineering for Space 2 [1622SE203A]	100%	Cijfer (10 t/m 100)	55	84

Content of unit of study	Engineering for Space
Learning outcomes	BoKS 2: Structures & Mechanics BoKS 3: Aerodynamics & Flight Mechanics BoKS 5: Electronics, Systems & Control BoKS 6: Materials & Manufacturing BoKS 8: Research & Design
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No

Specific details	None

Module with test	Engineering for Space 2	1622SE203A
Assessment objectives/criteria	Engineering for Space 1 & 2 contains the following disciplines: 1. Systems Engineering 2. Thermal Engineering 3. Materials & Structures 4. Attitude & Orbit Control Systems For the discipline 'Systems Engineering', the student shall be able to: • describe in technical terms the hardware and software elements that encompass a system that operates in Space. • execute system engineering tasks(produce a Product Breakdown Structure (PBS), Work Breakdown Structure (WBS), system and sub-system trade-off, requirements flow down, requirements verification & validation, review cycle, budgets, Interface Control). • understands the attitude and the role of a systems engineer. • navigate through the ECSS standards • execute a feasibility analysis for a satellite (system or sub-system) concept design For the discipline 'Thermal Engineering', the student shall be able to: • understand the physics of the space environment and its influence on materials and structures • make thermal balance calculations for a space system in orbit • become an advanced user of a computer tool for simulation of thermal behavior of a space system For discipline 'Materials & Structures', the student shall be able to: • understand which, and the reason why, materials (and related processes) are suitable for use in the space environment and where this can be traced back in the ECSS standards • investigate expected failure modes and load cases during several stages of the mission lifetime of a space system • get familiar with types of structures used in space systems and their external and internal interfaces • perform mechanical analyses for a (simple) preliminary design and validate the results using handbooks • understand which Finite Elements Analysis (FEA) methods should be used for a specific design case and what are its limitations in design and validation • understand how the manufacturing and assembly of space systems are executed	

	• understand how the structures of space systems are tested for dynamic and static loads For the discipline 'Attitude & Orbit Control Systems', the student shall be able to: • define the dynamics of a (multi-body) spacecraft and understand its properties (e.g.: moment of inertia 3D I-matrix) and characteristics. • understand the purpose of a spacecraft mission (specification and requirements and accuracy) • understand the physics behind the sensors required to meet the purpose of a spacecraft mission. • understand different control logics needed for the interaction between sensors and actuators within the Attitude and Orbit Control System (AOCS).	
Details of assessments	Schriftelijk without test session	Assignment
Permitted Aids	N/A	
Work methods and educational activities	Lectures	
Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Nee	

Space Project 2 [1622SE204Z]

Academic year	Term	Name of examination component	Study load in credits
4	blok 2	Space Project 2	6

Module name and code	Weighting factor	Assessment scale	Required minimum score	Number of study hours
Space Project 2 [1622SE204A]	100%	Cijfer (10 t/m 100)	55	168

Content of unit of study	Space Project

Learning outcomes	Competence 1. Analysis Competence 2. Design Competence 3. Realisation Competence 4. Control Competence 5. Management Competence 6. Advice Competence 7. Research Competence 8. Professionalisation
Requirements for participation in units of study (See also article 31a TER)	None
Phase of Bachelor's programme	hoofdfase
Qualitative requirement BSR	No
Graduation product designation	No
Sets requirement for the work environment	No
Professional part	No
Specific details	None

Module with test	Space Project 2	1622SE204A
Assessment objectives/criteria	Competence 1. Analysis Competence 2. Design Competence 3. Realisation Competence 4. Control Competence 5. Management Competence 6. Advice Competence 7. Research Competence 8. Professionalisation	
Details of assessments	without test session	Project dossier
Permitted Aids	N/A	
Work methods and educational activities	Project meetings, workshops, reviews, (Study) coaching	

Contact hours for strategies and teaching activities		
Compulsory attendance (See also Article 115 TER)	Ja	Presence is required for achieving the competences and for the individual assessment.