

# **TEACHING AND EXAMINATION REGULATIONS**

**(see Article 7.13 of the Higher Education and Research Act)**

**Engineering Doctorate (EngD)**


**PED / BPE**

**2024 - 2025**

**DELFT UNIVERSITY OF TECHNOLOGY**

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## Section 1 - General

### Article 1 - Areas to which the regulations apply

1. These regulations apply to the teaching and the examinations related to the Engineering Doctorate degree programmes in Process and Equipment Design and Designer in Bioprocess Engineering, hereafter to be referred to as the programme.
2. The teaching and organisation of the programme is the responsibility of the Faculty of Applied Sciences at Delft University of Technology, hereafter to be referred to as the faculty.
3. The programme is governed by Implementation Regulations, which constitute part of these Teaching and Examination Regulations.

### Article 2 - Definitions of terms used

The terms used in these regulations should be interpreted as meaning the same as in the Higher Education and Scientific Research Act, insofar as they are defined in that Act.

The following terms are to be defined thus:

- a. the Act: the Higher Education and Scientific Research Act (in Dutch, the WHW), in the Dutch Bulletin of Acts, Orders and Decrees, number 593 and as amended since;
- b. the programme: the Engineering Doctorate 's degree programme as denoted in Article 7.3a paragraph 1, subparagraph b of the Act;
- c. trainee: anyone enrolled in the Engineering Doctorate Degree Programme at Delft University of Technology for the purpose of benefiting from education and/or for the purpose of sitting the examinations and undergoing the degree audit which form part of the programme;
- d. cohort: (intentionally skipped)
- e. teaching period: half a semester;
- f. subject: a teaching unit within the programme as intended in Article 7.3, paragraphs 2 and 3 of the Act; A subject can consist of a number of components;
- g. practical: a practical exercise as intended in Article 7.13, paragraph 2, subparagraph d of the Act, taking one of the following forms:
  - writing a thesis;
  - conducting a project or experimental design;
  - completing a design or research assignment;
  - conducting a literature review;
  - completing a work placement;
  - participating in fieldwork or an excursion;
  - conducting tests and experiments;
  - participating in other educational activities aimed at enabling participants to attain certain skills.
- h. examination: an assessment of the knowledge, insight and skills of a trainee in relation to a subject, as well as the marking of that assessment by at least one examiner, appointed for that purpose by the Board of Examiners;
- i. component examination: an assessment of the knowledge, insight and skills of a trainee in relation to a component within a subject, as well as the marking of that assessment by at least one examiner, appointed for that purpose by the Board of Examiners;
- j. degree audit: an assessment by which the Board of Examiners, in accordance with Article 7.10 of the Act, establishes whether all examinations in the various subjects that constitute the programme have been successfully completed;
- k. Board of Examiners: the programme's Board of Examiners, which has been installed in accordance with Article 7.12 of the Act;
- l. examiner: the individual who, in line with Article 7.12c, of the Act, has been appointed to set the examinations;





m. Implementation Regulations:	the Implementation Regulations which form part of these Teaching and Examination Regulations;
n. credit:	a credit awarded in line with the European Credit Transfer System (ECTS); one credit denotes a study load of 28 hours;
o. working day:	Monday to Friday with the exception of recognised national public holidays;
p. study guide:	the digital guide to the programme containing specific information pertaining to the various subjects;
q. institute:	Delft University of Technology;
r. Blackboard:	the electronic system designed for the exchanging of teaching information;
s. Osiris:	the electronic system designed for the exchanging of student information;
t. disability:	all conditions which are (at least for the period in question) chronic or lasting in nature and which form a structural limitation for the trainee in receiving education and/or sitting examinations or taking part in practicals.

### **Article 3 - The programme objective (Combined EngD programmes)**

The programme aims to educate selected MSc-holders in (Bio)Chemical Engineering or Materials Engineering or related disciplines to become certified Designers, gaining the title "Engineering Doctorate", or "EngD".

Throughout the programme, the EngD-trainee is trained to develop and use the following qualities:

- An independent attitude
- A critical approach
- Creativity
- A focus on making an innovative design integrating (relevant) domain knowledge
- Self and project management skills, team working and communication skills

In order to complete the programme the final attainment levels described in Article 4 must be demonstrated.

### **Article 4 - The programme's final attainment levels**

Engineering Doctorates in Engineering graduates will:

1. have a working knowledge and understanding of the domain knowledge in the disciplines relevant for the selected EngD programme (such as: biological, chemical and/or material sciences, mathematics, thermodynamics, physical chemistry, chemical and physical engineering, product and/or process design and techno-economical sciences.
2. possess the qualities to master any relevant subject in product or process engineering in order to make an engineering design for (part of) a new device, product, process or equipment including its control or other user interface;
3. understand the different design phases in the life cycle of products and manufacturing processes and the role of the designer therein;
4. be capable of specifying the requirements for products, process or systems from the stakeholders' needs and regulations;
5. be able to understand the related (patent) literature and can evaluate the results from reports and publications;
6. be capable to contribute to the design and development of (new) application of products and/or processes, process-modes, using state-of-the-art design methodologies and tools;
7. be capable to integrate the base disciplines and creatively generate alternative design options, and to analyse and evaluate the feasibility of these design options with respect to customer requirements on quality, sustainability (environment, safety, health, economics, social, technology and reliability), and to provide systematic argumentation for design decisions;
8. be capable to design research experiments necessary and appropriate for the design task and evaluate their results;
9. be capable to perform a risk analysis for potential failures during the design phase;
10. be capable to specify the design solution in terms of quantifiable design parameters;
11. possess the ability to function in a team of professionals from diverse disciplines, implementing project management, team working, communication and reporting skills, and appreciating the relevance of different disciplines;



12. be capable to manage the design project, and to control human and financial resources in producing the deliverables of the project in time;
13. be capable to professionally promote and communicate about the design and design process.

Engineering Doctorates in Engineering graduates are expected to master the engineering design process and to be able to make an educated comparison between different design alternatives. They are expected to have a perception on the life cycle of product and process. Moreover, they are expected to have a clear notion on the difference between engineering design and operation. In addition, Engineering Doctorates in Engineering graduates should possess the following kinds of competence:

**Preparing an engineering design**

- Relative positioning of conceptual design in the process life cycle
- Perception of design and operation from the viewpoint of commercial companies
- Preparation of engineering drawings and diagrams (e.g. design sketch, Piping & Instrumentation Diagram and Process Flow Scheme)
- Simulation principles and modelling starting from first principles
- Perception of device, product, process or equipment analysis synthesis methods and tools
- Profound skills on techno economic evaluations

**Routinely using advanced tools for conceptual design (depending on selected EngD programme)**

- Advanced simulators (e.g. ASPEN+/SuperPro Designer)
- Dynamic simulators (e.g. Aspen Dynamics)
- Optimization methods and programs (e.g. Non-Linear Programming and Mixed Integer Non-Linear Programming)
- System integration using methodological approaches to create networks (e.g. Aspen Pinch/Water Pinch)

**Conceptual design**

- Generating of design alternatives
- Evaluation and ordering of design alternatives
- Setting up of a consistent basis for comparison of alternative design options
- Co-ordination of the activities of a design group
- Design of an experimental program for the acquisition of engineering data

**Article 5 - Admission to the programme**

1. Applicants possessing a certificate proving that they have successfully completed their Master of Science studies in Life Science & Technology, Chemical Engineering, Biochemical Engineering or related studies are eligible for admission to the programme.
2. The selection committee in consultation with the programme coordinator will assess applicants and make the decision for admission to the EngD programme.

**Article 6 (Intentionally skipped)**

**Article 7 – (Intentionally skipped)**

**Article 8 - Taking the programme on a full-time or part-time basis**

1. The EngD programme is taught on a full-time basis only.



## Article 9 - Language

1. Classes are taught and examinations and degree audits take place in English.
2. Notwithstanding the provisions of paragraph 1, the dean can give permission for classes to be taught in any other language than English if the particular nature of the subject, the organisation, the quality of the education or the origin of the trainees gives cause for this.
3. Should a trainee request permission to complete one or more parts of the examination or the degree audit in a language other than English, this will be subject to the stipulations of the Board of Examiners in this regard, as laid down in the Rules and Guidelines of the Board of Examiners.

## Section 2 - Composition of the study programme and the degree audit

### Article 10 – Composition of the study programme and the degree audit

1. The composition of the study programme and the relevant transitional regulations are laid down in the Implementation Regulations. Teaching will be provided as described in the study guide.
2. The audit to attain the Engineering Doctorate degree is part of the programme. The programme has a total study load of 120 credits.
3. It is not permitted for any subject in the study programme to have been part of the Bachelor's or Master's degree programme on the basis of which the trainee was admitted to the programme. If a compulsory subject in the study programme was already completed in the aforementioned Bachelor's or Master's degree programme the trainee will receive an exemption for the subject and selects an elective subject in its place. If an elective subject in the study programme was already completed in the aforementioned Bachelor's or Master's degree programme the trainee will choose an alternative elective subject.

## Section 3 - Honours Programme (Intentionally skipped)

### Article 11 (Intentionally skipped)

## Section 4 - Registering and withdrawing

### Article 12 – Registering for examinations

1. Registration to take part in a written examination is done by entering the required data into the examination registration system no later than 14 calendar days (that is, not working days) before the examination.
2. Trainees may submit a request to register for an examination after the deadline mentioned in paragraph 1 has passed, but no later than two working days before the examination in question, at the central examination desk. The request will be honoured providing that places are available at the time of registration in the room or rooms where the examination is scheduled to take place. The trainee will be informed one working day before the examination takes place.
3. In the case of circumstances beyond a trainee's control, whereby the trainee is unable to register for the examination, the Board of Examiners can still permit the trainee to participate in the examination.
4. The following applies upon entering the examination room:
  - a. only trainees with valid proof of identity will be admitted to the examination. The following will be accepted as proof of identity: campus card, passport, identity card or driving licence.  
and
  - b. trainees will only be admitted to the examination with a valid examination ticket and/or if they are included in the list of participants.
5. If a trainee has participated in an examination without a valid examination ticket, the examination work will be considered invalid, will not be evaluated and does not lead to a result.
6. The trainee can submit a substantiated request to the Board of Examiners to have examination work that is considered to be invalid to be declared valid and to have it evaluated.





#### **Article 13 - Registering for practicals**

1. Registration for practicals will take place in the manner and by the deadline indicated in the study guide or on Blackboard for the practical in question.
2. In special cases the Board of Examiners may deviate from the period of registration referred to in paragraph 1, however only in favour of the trainee.
3. Trainees who do not register for a practical on time may not participate in that practical. In exceptional circumstances the Board of Examiners may allow the trainee to participate in the practical.
4. If a trainee participates in a practical for which the trainee was not properly registered, the Board of Examiners may declare the results of the practical to be invalid.

#### **Article 14 - Withdrawal or absence**

1. It will be possible to withdraw from an examination via the examination registration system up to 3 working days before the examination takes place.
2. A trainee willing to participate in a subsequent occasion should re-register, in accordance with the provisions of Art. 12.

### **Section 5 - Examinations**

#### **Article 15 – Number, times and frequency of examinations**

1. There are two opportunities in each academic year for sitting examinations:
  - the first opportunity is immediately after the teaching period for the subject to which the exam in question relates,
  - the second opportunity is at the end of the first or second semester, or else during the resit period in August.
2. The frequency of examinations is laid down in the Implementation Regulations. A timetable of all the opportunities for sitting written examinations is drawn up on an annual basis and distributed before the start of the academic year.
3. If there is no indication as to the number of times a particular examination can be taken in any one academic year, because it relates to a subject not taught by the programme itself, the relevant stipulations in the Teaching and Examination Regulations of the other programme will apply. The Board of Examiners reserves the right to make decisions that deviate from the norm regarding this matter.
4. Notwithstanding the provisions of paragraph 1, there will be at least one chance in a year to sit examinations relating to subjects not taught in a given academic year.
5. In exceptional cases, the Board of Examiners may permit a deviation from the standard number of times that certain examinations can be taken.

#### **Article 16 – Sequence of examinations**

1. The sequence in which trainees are required to sit examinations and participate in practicals is laid down in the Implementation Regulations.

#### **Article 17 – Validity of examinations**

1. The result of an examination is valid for an unlimited period. However, in cases where the examination result dates from over 4 years ago, the Board of Examiners may impose an additional or substitute examination.
2. The terms of paragraph 1 likewise apply to component examinations provided that the results are administered in Osiris, unless the validity of the component examination is linked to a period of time mentioned in the study guide.

#### **Article 18 - The form of examination and method of assessment**

1. Examinations are set as described in the study guide.
2. If there is no indication as to the way an examination is to be set, because it relates to a subject not taught by the programme itself, the relevant stipulations in the Teaching and Examination Regulations or the manual of the other programme will apply.
3. The Board of Examiners may, if it so wishes, deviate from the provisions of paragraphs 1 and 2, in favour of the trainee.



#### **Article 19 - Oral examinations**

1. Only one trainee at a time will sit an oral examination, unless the examiner in question specifies otherwise.
2. Oral examinations will be held in public, unless determined otherwise by the Board of Examiners in a special case or unless the trainee has formally objected to the public nature of the examination. Public means that both the trainee and the examiner agree to invite an observer with the aim to guarantee the objectivity of the examination.
3. Prior to an oral examination, the examiner must ask the trainee to provide proof of identity.

#### **Article 20 - Determining and announcing the results**

1. The examiner is required to supply the trainee with a written statement of the result of an oral examination.
2. The examiner is required to determine the result of examinations as soon as possible after the examination but within 15 working days at most. The examiner forwards the necessary details to the student administration. Taking due account of the trainee's right to privacy, the student administration then ensures that the results are registered and published within 20 working days of the examination date. If the examiner is not able to meet these requirements due to exceptional circumstances, he or she must inform the Board of Examiners, stating the reasons for the delay, and inform the trainees as soon as possible.
3. In cases where the period referred to in paragraph 2 is not feasible, the Board of Examiners will determine beforehand precisely how and within what period of time the trainee will be notified of the results.
4. When receiving the result of an examination, the trainee will be made aware of his or her right to inspect the results as referred to in Article 21, as well as the opportunity to lodge an appeal with the Examination Appeals Board.

#### **Article 21 – The right to inspect the results**

1. For a period of at least 20 working days after notification of the results of an examination, the trainee has the right to inspect his or her marked work, on request. If a trainee intends to lodge an appeal regarding the marking of his or her work, he or she will be supplied with a copy of the marked work.
2. During the period referred to in paragraph 1, all interested individuals may acquaint themselves with the questions and assignments set in the examination, as well as with the criteria used for marking.
3. The Board of Examiners may determine that the right to inspection or perusal referred to in paragraphs 1 and 2 will take place at a location specified beforehand and at no less than two specific times, also decided on beforehand. If the trainee can prove that he/she is or was unable to be present at the location at the set time due to circumstances beyond his or her control, then another opportunity will be provided, if possible within the period stated in paragraph 1. The location and times mentioned in the first sentence will be announced well in advance.

#### **Article 22 – Discussing the examination results**

1. As soon as possible after the results of an oral examination have been announced, an opportunity can be arranged for the examiner to discuss the results with the trainee, either at the trainee's request or at the instigation of the examiner. At this meeting, the reasons behind the marks awarded will be explained.
2. For a period of 20 working days after the results have been announced, trainees who have taken a written examination may submit a request to discuss the results with the relevant examiner. The discussion will take place within a reasonable time span and at a place and time determined by the examiner.
3. In cases where a collective discussion is organised by or on the instructions of the Board of Examiners, a trainee may only submit a request, as described in the preceding paragraph, if he/she was present at the collective discussion and if he/she provides a good reason for the request or if, due to circumstances beyond his/her control, he/she was unable to attend the collective discussion.
4. The provisions of paragraph 3 are similarly applicable if either the Board of Examiners or the examiner first gives the trainee the opportunity to compare his/her answers with model answers.
5. The Board of Examiners may permit departures from the provisions of paragraphs 2 and 3.

### **Section 6 - Studying with a disability**

#### **Article 23 - Adaptations to help trainees with a disability**

1. Trainees who have a physical or sensory disability are entitled to adaptations in teaching, examinations and practicals, on written request. These changes will be geared as much as possible to a trainee's individual needs, but they must not affect the quality or the degree of difficulty of a subject or an examination



programme. The facilities provided to this end may involve adapting the form or duration of examinations and/or practicals to the trainee's individual situation or making practical aids available.

2. The request referred to in paragraph 1 should be accompanied by a recent medical certificate from a physician or a psychologist. If there is evidence of dyslexia, the request should be accompanied by a document issued by a recognised dyslexia-testing bureau (i.e. registered with BIG, NIB, or NVO). If possible, this certificate should also estimate the extent to which the disability forms an obstacle to study progress.
3. Requests for the adaptation of teaching facilities will be decided upon by the dean or by the director of studies acting on the dean's behalf. The Board of Examiners will be decided on requests for adaptations to examinations.

## **Section 7 - Exemptions**

### **Article 24 - Exemption from examinations or practicals**

After having been advised by the relevant examiner, the Board of Examiners may decide to exempt trainees from an examination or practical on the grounds of:

- a. an examination, degree audit or practical completed within the Dutch higher education system or elsewhere which, as regards content and study load, corresponds with the subject for which exemption is sought, or
- b. knowledge and/or skills acquired outside the higher education system.

## **Section 8 - Degree audit**

### **Article 25 – The times and frequency of the degree audit**

Two times a year there is an opportunity to undergo the audit to attain the Engineering Doctorate degree. The dates set by the Board of Examiners are published at least 2 month in advance.

## **Section 9 - Study progress checks**

### **Article 26 (Intentionally skipped)**

### **Article 27 (Intentionally skipped)**

### **Article 28 – Study progress checks**

The student administration is responsible for ensuring that each trainee is able to see and check his/her own results via Osiris.

## **Section 10 - Contravention, changes and implementation**

### **Article 29 – Contravening the regulations**

If the study guide and/or any other regulations relating to the study programme and/or the examination programme prove to contravene these Teaching and Examination Regulations and the accompanying Implementation Regulations, precedence will be given to the provisions of these Teaching and Examination Regulations in combination with the Implementation Regulations.

### **Article 30 – Changes to the regulations**

1. Any changes made to these regulations will be made by special resolution of the dean.
2. No changes made will affect the current academic year unless it is reasonable to suppose that the interests of trainees will not be adversely affected.
3. None of the changes may, to the detriment of the trainee, influence any decisions concerning a trainee that are made by the Board of Examiners on the basis of these regulations.

### **Article 31 – Transitional regulations**

1. If the composition of the study programme undergoes intrinsic changes or if these regulations are amended, the dean will draw up transitional regulations that will be incorporated into the Implementation Regulations.
2. Such transitional regulations are required to include:
  - a. a provision concerning the exemptions that can be given on the basis of the examinations already passed;
  - b. a provision specifying the period of validity of the transitional regulations.
3. If a subject is removed from the study programme, four opportunities to sit an examination in this subject will be granted after the last classes have been taught: an examination following on from the classes, a resit in the same academic year, and two resits in the subsequent academic year.

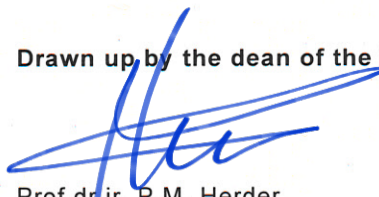
### **Article 32 – Publication of the regulations**

1. The dean is responsible for finding a suitable way of publicising these regulations and the relevant Implementation Regulations, as well as any changes to the regulations.
2. The Teaching and Examination Regulations, together with the accompanying Implementation Regulations, will be published such that these are assessable to the trainees in the programme.

### **Article 33 – Entry into force**

This ruling will come into effect on 31 August 2024.

**Drawn up by the dean of the faculty on**



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