Faculty of Science & Technology

UNIVERSITEIT TWENTE.

Programme-specific part of the programme section of the students' charter including the Education and Examination Regulations for the bachelor's programme in Chemical Science & Engineering as of 1 September 2024

(Article 7.13 and 7.59 of the Higher Education and Research Act)

Contents

Preamble

1. The rules in this programme-specific part apply to the full-time bachelor's programme in Chemical Science & Engineering.
2. This programme-specific part and the general section (TNW/24.1016/EM) together constitute the programme section of the students' charter, including the Education and Examination Regulations for the bachelor's programme in Chemical Science & Engineering at the University of Twente.
3. The rules established by the Chemical Science & Engineering Examination Board with regard to the performance of its duties and powers in accordance with 7.12b of the Higher Education and Research Act are included in the 'Rules and Guidelines of the Chemical Science & Engineering Examination Board'.
4. When reference is made to 'the (study) programme', 'the Programme Committee' or 'the Examination Board', it refers to the Chemical Science & Engineering bachelor's programme, the Programme Committee or Examination Board of the Chemical Science & Engineering bachelor's programme, respectively.

Reference: TNW/24.1021
Date: July 11, 2024

Article 1 Definitions

In addition to the definitions as stated in Article 1.2 of the general section of the Education and Examination Regulations, a practical exercise as referred to in Article 7.13, paragraph 2d of the WHW, is a study unit or part thereof, where the emphasis lies on the personal activity of the student, such as:

1. performing a literature study, performing an assignment, creating a test design, writing a thesis, article or position paper or preparing a public presentation,
2. completing a design or research project, performing tests and experiments, participating in practicums, practicing skills,
3. participating in field work or an excursion, participating in other educational activities that are deemed necessary, focused on achieving the intended skills, for example, focused practice of chemical skills in a skills lab specifically equipped for that purpose.

Article 2 Programme objectives

The objectives of the bachelor's programme are as follows:

a) to educate students theoretically and practically and to provide them with skills needed for research, design and organisation in the areas of chemistry, materials science and process engineering,
b) to offer a broad curriculum which enables students to orientate themselves within the discipline and beyond the boundaries of the discipline,
c) primarily, to prepare for a master's programme in the field of chemical science & engineering and related disciplines,
d) alternatively, to prepare for a direct entrance to the labour market for technical positions at a bachelor's level in the field of chemical science & engineering research, design and teaching.

The competence areas and intended learning outcomes for the holder of a bachelor's degree in Chemical Science & Engineering are elaborated in Article 4.

Article 3 Connecting master's degree programme

Successful completion of the bachelor's exam grants access to the master's programme in Chemical Science & Engineering at the Faculty of Science & Technology of the University of Twente. For the connection with other chemistry/ chemical engineering programmes in the Netherlands, refer to "doorstroommatrix.nl" (transfer matrix).

Article 4 Intended learning outcomes for the programme

The intended learning outcomes for this programme have been described on the basis of the 3TU Academic Competencies, better known as the Meijers' criteria[1]. These criteria have been approved by the Dutch-Flemish Accreditation Organisation (NVAO) and provide a framework that systematically defines the general intended learning outcomes for an academic programme, in which specific aspects for individual programmes may also be included.

A university graduate in a technical field can be characterised using seven competence areas. They:

1. are competent in one or more scientific disciplines;
2. are competent in doing research;
3. are competent in designing;
4. have a scientific approach;
5. possess basic intellectual skills;
6. are competent in cooperating and communicating;
7. take account of the temporal and the social context.

These competences can be divided into three groups (see Fig. 1):

(a) programme domain (1,2,3)
(b) academic approach to thinking and acting (4, 5, 6)
(c) context of conducting scientific research (7)

Each competence area comprises a combination of knowledge, skills and attitude [ksa], as specified in the Programme Intended Learning Outcomes (PILOs).
Essential skills are taught and assessed throughout the programme and relate to all seven competence areas. We explicitly teach and assess these essential skills: 1. Inquiry and analysis; 2. Critical thinking; 3. Creative thinking; 4. Written communication; 5. Oral communication; 6. Reading; 7. Quantitative literacy; 8. Information literacy; 9. Teamwork; 10. Problem solving (incl. Design and Modelling); 11. Civic engagement – local and global (incl. Sustainability awareness); 12. Intercultural knowledge and competence; 13. Ethical reasoning; 14. Integrative learning with conceptual modelling.

[1] Meijers, A. W. M., Borghuis, V. A. J., Mutsaers, E. J. P. J., Overveld, van, C. W. A. M., & Perrenet, J. C. (2005). Criteria voor academische bachelor en master curricula = Criteria for academic bachelor's and master's curricula. (2e, gewijzigde druk. ed.) Eindhoven: Technische Universiteit Eindhoven.

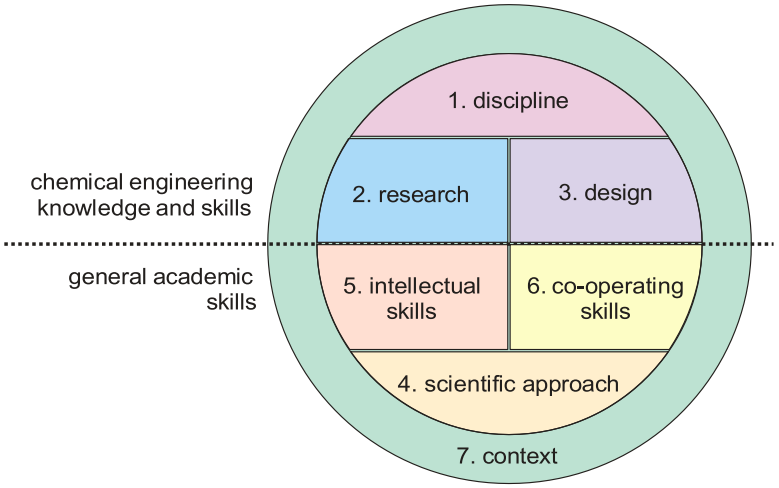

Figure 1. Seven competence areas of Chemical Science & Engineering according to Meijers' criteria

The competence areas are elaborated in the PILOs below. For each competence, it is indicated whether its emphasis is on knowledge (k) and/or skills (s) and/or attitude (a).

The bachelor graduate Chemical Science & Engineering (CSE):

1. *understands the basics of and has some skills in the field of chemical science & engineering.*
   A bachelor graduate is (1) familiar with the basics of existing scientific knowledge and has some skills to increase and develop this through study [a, b, e, f], and (2) has developed basic experimental skills [c, d].

1a.	Understands the knowledge base and the structure of the relevant fields in chemical engineering: • chemistry: analytical chemistry, inorganic chemistry (properties), organic chemistry (synthesis and properties), electrochemistry, physical chemistry, catalysis, • inorganic and organic materials science (synthesis and properties), • process engineering: physical transport phenomena, chemical reactors, separation technology, process design, • the supporting disciplines: applied mathematics, physics and applied computer science. The bachelor graduate understands the relevant key concepts, theories, methods, and techniques. [k]
1b.	Understands the structure of these relevant fields, and the connections between sub-fields. [k]
1c.	Has knowledge of and some skill in the way in which the following activities take place in chemical engineering: [ks] • truth-finding and the development of theories and models, • interpretations of texts, problems, data, and results, • experiments, gathering of data and modelling, • decision-making based on data and modelling.
1d.	Has some experimental skills in the relevant fields [ks]: • chemistry and materials science: synthesis and qualitative and quantitative determination of properties of chemical substances, • process engineering: qualitative and quantitative characterisation of chemical processes.
1e.	Is aware of both the presuppositions of the standard methods and their importance. [ka]
1f.	Is able (with supervision) to reflect on his/her own knowledge, and to revise and extend knowledge through study. [ksa]

2. *has the basic knowledge and skills for doing research in the field of chemical engineering.*
   A bachelor graduate can, under supervision of a senior researcher, contribute to increasing scientific knowledge.

2a.	Is aware of the research methodology in the field of chemical engineering [ka]
2b.	Is, under supervision, able to do research at bachelor's level: • analyse research problems in the field of chemical engineering with a limited complexity, • use the relevant knowledge base, • formulate the research objectives and, if relevant, the appropriate hypothesis, • formulate a research plan including the required theoretical and experimental steps, assumptions and approaches, • execute the different activities of the research plan, • analyse and evaluate the research results in respect to the defined problem, • assess research results on its usefulness,

	• defend the results against the parties involved. [ksa]
2c.	Is observant and has the creativity and the capacity to discover certain connections and new viewpoints. [ksa]
2d.	Is able to work at different levels of abstraction and detail. [ks]
2e.	Is able to recognise, systematically collect, analyse, select and process relevant scientific information. [ks]
2f.	Understands, the importance of other disciplines, where necessary; is able to interconnect these and to cross disciplinary boundaries (interdisciplinarity). [ka]
2g.	Is aware of the changeability of the research process through external circumstances or advancing insight. [ka]
2h.	Is, under supervision, able to contribute to the development of scientific knowledge in one or more areas of the disciplines involved in chemical engineering. [ks]

3. *has the basic skills for designing a chemical product or process in the field of chemical engineering.*
A bachelor graduate is familiar with the steps of the design process and able to carry them out in a not-complex situation.

3a.	Is aware of the design methodology in the field of chemical engineering and is aware of design being a cyclic process. [ksa]
3b.	Is able to design at bachelor's level under supervision: • analyse design problems in the field of chemical engineering with a limited complexity, • integrate the relevant knowledge base in a design, • formulate the design requirements, objectives and boundaries, taking into account some safety, sustainability, environmental and economic aspects, • formulate and execute the different activities of the design plan, • defend the results against the parties involved. [ksa]
3c.	Is able to integrate existing knowledge in a design. [ks]
3d.	Is able to systematically collect, analyse, select and process relevant design information from literature, patents, databases and websites and is able to estimate lacking information [ks]
3e.	Can generate creative ideas and translate them into practical solutions for design problems. [ksa]
3f.	Is able to work at different levels of abstraction and detail including the system design level. [ks]
3g.	Is aware of the changeability of the design process through external circumstances or advancing insight. [ka]
3h.	Understands the importance of other disciplines (interdisciplinarity) and their contribution to the design process. [ks]

4. *has knowledge of a scientific approach.*
A bachelor graduate has a systematic approach characterised by the use of theories, models and coherent interpretations.

4a.	Is inquisitive and has an attitude of life-long learning. [a]
4b.	Has a systematic approach characterised by the application of theories, models and coherent interpretations. [ksa]
4c.	Has the knowledge and the skill to justify and use models for research and design and assess their value ('model' is understood broadly: from mathematical model to scale model). Is able to adapt models for their own use. [ks]
4d.	Has the ICT skills to process data and models. [ks]
4e.	Has insight into the nature of sciences and technology (purpose, methods, differences and similarities between scientific fields, nature of laws, theories, explanations, role of the experiment, objectivity etc.) [k]
4f.	Has some insight into scientific practice (research system, relation with stakeholders, publication system, importance of integrity etc.) [k]
4g.	Is able to document adequately the results of research and design. [ksa]

5. *possesses some basic intellectual skills such as reasoning, reflecting and forming a judgment.*
A bachelor graduate has some skills in reasoning, reflecting, and forming a judgment.

5a.	Is able (with supervision) to reflect critically on his/her own thinking, decision making and acting, and able to adjust his/her behaviour on the basis of this reflection. [ksa]
5b.	Is able to reflect on his/her more strong and weak capabilities with regard to his/her role as researcher, designer, organiser, and teacher/advisor and is able to adjust on the basis of this reflection. [ksa]
5c.	Is able to reason logically and apply methods of reasoning. [ks]
5d.	Is able to ask adequate questions, and has a critical yet constructive attitude towards analysing and solving simple problems in chemical engineering. [ksa]

5e.	Is able to form a well-reasoned opinion in the case of incomplete or irrelevant data or uncertainty. [ks]
5f.	Is able to take a standpoint with regard to a scientific argument in chemical engineering. [ksa]
5g.	Possesses basic numerical skills and has an understanding of orders of magnitude. [ks]

6. *is able to cooperate in projects and communicate.*
   A bachelor graduate is able to work with and for others. This requires not only adequate interaction, a sense of responsibility, and leadership, but also good communication with colleagues and other stakeholders.

6a.	Is able to communicate in writing (logbook, research and design report), and verbally in English (scientific presentation) about the results of learning, thinking and decision-making with colleagues, non-colleagues and managers. [ks]
6b.	Is able to interpret English-written scientific literature and textbooks and to understand discussions and scientific debates in English. [s]
6c.	Is characterised by professional behaviour. This includes: reliability, integrity, commitment, accuracy, perseverance and independence as well as respect for others irrespective of their age, social-economic status, education, culture, philosophy of life, gender identity, race or sexual nature. [ksa]
6d.	Is able to perform project-based work: is pragmatic and has a sense of responsibility; is able to deal with limited resources; is able to deal with risks, is able to negotiate compromises. [ksa]
6e.	Is able to work and communicate within an intercultural and interdisciplinary team, taking into account different international, cultural, educational and societal backgrounds of peers and audience. [ksa]
6f.	Has insight into, and is able to deal with, team roles and social dynamics. [ksa]

7. *is aware of the social, environmental, sustainability and safety context.*

   A bachelor graduate is aware that beliefs and methods have origins and that decisions have social consequences in time.

7a.	Is aware of the social, environmental, sustainability and safety aspects of the chemical and related industries and is familiar with Life Cycle Analysis. [ks]
7b.	Has an eye for the different roles of chemical engineering professionals in society: researcher, designer, organiser, teacher/advisor. [ks]
7c.	Is able to analyse the place of chemical engineering in society and to discuss the social, environmental, sustainability and safety consequences of new developments in relevant fields with colleagues and non-colleagues. [ks]
7d.	Is able to analyse and to discuss the ethical and the normative aspects of the consequences and assumptions of scientific thinking and acting with chemical engineering colleagues and non-colleagues (in research, designing and applications). [ksa]

Article 5 Language

1. The bachelor's degree programme is an English-taught programme. All study materials and all assessments are in English.
2. In module evaluations and student panel meetings the English language proficiency of teaching staff is a standard subject. If evaluation results indicate that improvement is necessary, the programme director will urgently appeal for the involved staff member to improve their English proficiency.
3. Articles 2.2, 3.1 paragraph 4, and 3.6 paragraph 2c of the general section apply *mutatis mutandis*[2] to this article.

Article 6 Bachelor's final examination

The bachelor's final examination consists of the programme taught in the first, second and third years of study (B1, B2 and B3, respectively). The core programme consists of the B1 and B2 programmes, each of which consists of 4 modules of 15 EC each. A module consists of a number of study units. A study unit consists of one or more study unit components.

The tables below seek to present the programme as accurately as possible. The contents, intended learning outcomes and assessment methods of each module and module component are described in more detail in the "Module Description and Assessment Plan" of each module. Further information can also be found in the Osiris education catalogue and on the Canvas sites of the respective modules or study units.

[2] *Mutatis mutandis* is a Latin term commonly used in English legal texts. It is used when comparing two or more things to say that although changes will be necessary in order to take account of different situations, the basic point remains the same.

The modules and study units of the B1 programme are:

Module number and name	Study units & components	Education design and assessment	EC
1. Chemistry	Fundamentals of chemistry (8.5 EC): chemistry project, inorganic part, organic part, polymer part Lab course 1 (2.5 EC): introductory lab course, organic preparatory practicum. Intro Math and Calculus 1A (4 EC): Introduction to Maths, Calculus 1A	Project: in groups. Assessment based on project journal and discussion. Mathematics and chemistry: lectures and tutorials. Assessment based on written tests and a case. Practicum: Assessment based on safety test, participation, lab journals, Matlab and error analysis assignments.	15
2. Process Engineering	Thermodynamics (4.5 EC) Process engineering (5 EC): theory, practicum, project. Lab course 2 (2.5 EC) Calculus 1B (3 EC)	Project: in groups. Assessment based on a report and oral test. Mathematics, thermodynamics and process engineering: lectures and tutorials. Assessment based on written tests and a case. Practicum: Assessment based on participation and lab journals, Matlab and error analysis assignments.	15
3. Materials Science	Materials (9.5 EC): quantum mechanics of atoms and molecules, structure and properties of materials, material properties of polymers, project materials. Lab course 3 (2.5 EC) Linear Algebra (3 EC)	Project: in groups. Assessment based on group report, presentation, and writing assignment. Mathematics and materials science: lectures and tutorials. Assessment based on written tests and a case. Practicum: assessment based on participation and lab journals.	15
4. Equilibria and Electrochemistry	Equilibria (5 EC): chemical equilibria, phase diagrams. Think like a researcher (Electrochemistry) (7 EC): theory, practicum, project Conceptual Modelling. Calculus 2 (3 EC)	Project: in groups. Assessment based on group report. Mathematics, equilibria and electrochemistry (theory): lectures and tutorials. Assessment based on written tests and a case. Practicum: in groups; individual assessment based on participation, lab journals and reports.	15
Total B1			60

The modules and study units of the B2 programme are:

Module number and name	Study units & components	Education design and assessment	EC
5. Sustainable Industrial Processes	Industrial chemistry and processes (ICP) (4 EC) Sustainable industrial chemistry project (4.0 EC) Essential skills I (0.5 EC) Kinetics & catalysis (4.5 EC) Vector calculus (2 EC)	Project: in groups. Assessment based on report and presentation. Mathematics, Kinetics & catalysis, Industrial chemistry and processes: lectures and tutorials. Assessment based on written tests. Essential skills: Assessment based on (self-) assessments and reflections about six essential skills (defined in assessment plan).	15
6. Transport Phenomena	Physical transport phenomena (7.5 EC): fluid dynamics, heat transfer, heat & mass transfer + process equipment Numerical methods (3.5 EC) Project transport phenomena (4 EC)	Project: in groups. Assessment based on report and presentation. Theory: lectures and tutorials. Assessment based on written tests. Practicum: assessment based on participation and reports. Numerical methods: lectures and tutorials. Assessment based on assignments and written test.	15
7. Molecules and Materials	Organic and bio-organic chemistry including Lab course (8 EC): organic and bio-organic chemistry, lab course Interface Science (3 EC) Characterisation of molecules & materials chemistry (4 EC): analytical chemistry, practicum analytical & surface chemistry	Organic chemistry, Interface Science, and Analytical chemistry (part of Characterisation of molecules & materials chemistry): lectures and tutorials. Assessment based on written tests and assignments. Practicum: assessment based on participation and reports.	15

8A. Process Design Or 8B. Materials Science & Technology	Project process design (7 EC): designing an industrial process Introduction to Separation methods (4 EC) Introduction to Chemical Reaction Engineering (4 EC)	Project: in groups. Assessment based on report and oral examination. Introduction to Chemical reactor science, separation methods: lectures and tutorials. Assessment based on written tests and assignments. Practicum (separation methods): assessment based on participation, assignment and report.	15
	Advanced materials and project (7 EC): theory, project. Chemistry and technology of inorganic materials (4 EC) Chemistry and technology of organic materials (4 EC)	Project: in groups, assessment based on report and presentation. AM, CTOM and CTIM: lectures and tutorials. Assessment based on written tests.	15
Total B2			60

This programme applies to students belonging to the cohort that started the programme in 2024-2025.
For students belonging to the 2020 and earlier generations, different B1, B2, and B3 programmes may apply. Further information on transitioning between the programmes for these generations can be found on the website of the programme in question, in accordance with Article 13 of this programme-specific part.

The B3 programme has a study workload of 60 EC. The modules of the B3 programme are:

Module number and name	**Study units**	**Education design and assessment**	**EC**
9. and 10. Minor / optional course profile	Varies per minor. Please refer to the Osiris education catalogue and https://www.utwente.nl/en/education/electives/minor (The 'options matrix' on the website shows which minors CSE students are eligible to take.)		30 (or 2x15)
11. Intro Bachelor Assignment	Research/Science (1.5 EC). Ethics (2.5 EC). Preparation bachelor assignment (PBA) (2 EC). Essential skills II (1.0 EC) Statistics (3 EC). Elective course (5 EC): choice from list in M11 assessment plan. Alternatively, a student can ask approval from the Examination Board to choose another elective course in the technical domain.	Research/Science, Ethics, Statistics: lectures and tutorials. Assessment based on assignments and written tests. Preparation bachelor assignment: tutorials. Assessment based on two oral and two written assignments. Essential skills II: Assessment based on (self-) assessments, reflections and an oral exam about fourteen essential skills (see assessment plan). Elective: Differs per course. Please refer to the Osiris education catalogue.	15
12. Final bachelor's assignment	Final bachelor's assignment (15 EC): The bachelor's project addresses a topic belonging to the field of chemical science and engineering. Assessment based on report and presentation.		15
Total B3			60

The project will generally be scheduled for the fourth quarter. Conditions for participation in the final bachelor's assignment module are specified in Articles 9.3 and 9.4 of this programme-specific part.

Information about if, how, and under which conditions CSE bachelor students can follow a specific master course is included in the Osiris course information. Any completed master course during a student's bachelor's programme will not count towards the master degree of that student.

Article 6a Two bachelor programmes in three years

Per 2024, it is possible to combine the CSE bachelor's programme with the Applied Physics ("Technische Natuurkunde", TN) bachelor's programme. Students follow an integrated programme[3] that can be found in the TN programme-specific EER. Students who wish to follow both programmes need to discuss this with the TN programme staff before enrollment. As TN is taught in Dutch, students need to be fluent in Dutch (see EER TN (TNW/24.1026), art. 4.4).

Article 6b Exceptional ability

Students with exceptional ability can obtain the judicium "cum laude". Criteria are depicted in the Rules & Regulations of the CSE Examination Board.

[3] The combination of the CSE and the TN bachelor's comprises on average 20 EC per module. Instead of 180 EC, these students must pass at least 236 EC to obtain both the CSE and the TN diploma. They can do so in three years. The BSA requirements for these students are described in Article 11.2 of this document.

Article 7 Resits and validity of test results

1. In addition to Article 3.1 paragraph 5 of the general section of the bachelor's Education and Examination Regulations, students must always be permitted to participate in resits for which they have subscribed.
2. All study units from the B1 and B2 programme, and module 11 from the B3 programme are subject to the following rules with regard to the validity of test results registered in Osiris:
   a) The validity of all study units as defined in Article 6 that have been completed is unlimited.
   b) A component level grade from a study unit remains valid until the end of the next academic year if the component is explicitly mentioned as such in the module's examination scheme (part of the Module Description and Assessment Plan), and the grade meets the minimum requirements as set in the examination scheme of the year in which the component level grade was obtained.
3. A math study unit in one of the modules 1-4 that was completed with a grade in the range 5.0-5.4 can be counted as a pass (noted as a C5 on the study progress overview) when all other study units from the B1 programme have been completed with a pass grade, and at least 1 other math study unit in module 1-4 was completed with a grade ≥ 6.5.
4. The examination board may grant extra resits and/or extensions of the validity of test results to individual students who qualify for the FOBOS[4] regulations, with the aim of limiting their study delay. For this, the student has to draw up, in consultation with the study advisor, a multi-year study plan, which must be approved by the Examination Board. See also Article 5.2 of the general section of the Education and Examination Regulations.

Article 8 Safety

There are certain safety requirements for working in a laboratory. Students are obliged to take note of these rules[5] and to comply with them. Students are not allowed to work in any of the chemical laboratories until after they have passed the introductory safety test that is part of Lab Course 1, or an alternative test that the Examination Board approved, appropriate to the work that is to be conducted.

Article 9 Order of study units

1. Before the start of a study unit, the student must meet the prior knowledge requirements for that study unit as specified in the Osiris education catalogue.
2. A student must have completed at least 90 EC of the bachelor's programme before a minor can be started.
3. Students who wish to do the final bachelor's assignment must meet the following conditions:
   a. the student has completed all of the exams of the required study units of the B1 programme, with at most one remaining to be completed;
   b. the student is yet to complete no more than 15 EC from modules 1-10. The student can plan to do maximally 5 EC in courses in parallel to the BSc-assignment. In case more than 5 ECs have to be completed, the remaining ECs have to be done after finishing the BSc assignment;
   c. two presentations and the draft introduction within study unit PBA (Preparation Bachelor Assignment, taught in quartile 1 and 3) must have been passed;
   d. a student who does courses or tests, extracurricular activities (like activism, side jobs, etc.), plans holidays or periods of absence for other reasons in parallel to the bachelor's assignment should plan extra time for the period of the bachelor's assignment. The maximum allowed extra time is three weeks. This must be indicated on the Final Bachelor's assignment agreement form. If the needed time exceeds three weeks then article 9.4 applies;
   e. the student should hand in the final report in week 10 after the start of the bachelor's assignment, or as much longer as is planned in article 9.3.d. The final examination session (BSc assignment colloquium) can be planned at a date after that, within a period of 4 weeks.
4. The Examination Board is authorised to grant exemptions from the conditions stated in articles 9.2 and 9.3. in the case that the strict application of the conditions would entail an unjustifiable delay in the studies of the student in question. The student must consult the study advisor before submitting a request to the Examination Board.
5. Students who can demonstrate that they already acquired competences that are comparable in content, size and level to one or more study units or parts thereof, e.g. on account of exams or final examinations in the higher education domain passed earlier, or knowledge or skills acquired outside the higher education domain, can make a request to the Examination Board to be exempted for the respective study units. The total study load of exemptions for a student cannot exceed 60 EC for the entire bachelor programme.

Article 10 Student guidance

1. All students have the option to get a mentor assigned in the first semester of the first year. A mentor is a lecturer in the CSE programme.

[4] FOBOS: Financial Support for Special Circumstances of Students; https://www.utwente.nl/en/ces/sacc/regulations/fobos/fobos/force-majeure/

[5] See the Health & Safety and Environmental Regulations at and the information provided by the Practical Department of the Faculty of Science & Technology, at https://www.utwente.nl/en/tnw/slt/.

2. The mentor follows the progress of all students assigned to them, providing them with advice when asked or when deemed necessary. The mentor and/or the study adviser actively stay in touch with students during their first year.
3. In their first year at university, all students are invited to at least two progress meetings with their mentor in their first year, of which one meeting is scheduled during the first semester. On their own initiative, students are entitled to have at least one progress meeting per year with their study adviser and/or with their mentor after their first year at university.
4. The study adviser is tasked with advising individual students about all aspects of their degree programmes, as well as informing the programme director about the progress of the students in question.

Article 11 (Binding) recommendation on continuation of studies (BSA)

1. The additional requirements that students must meet, as intended in Article 6.2 paragraph 2 of the general section of the Education and Examination Regulations, include that
   a) at least 3 of the math study units of modules 1-4 must have been completed with a passing grade (grade recorded in Osiris $\geqslant$ 6.0), or
   b) two of the 4 math study units of modules 1-4 have been completed with a passing grade (grade recorded in Osiris $\geqslant$ 6.0), and at least 2 out of the 3 study units/study unit components Thermodynamics (module 2), Quantum Mechanics of Atoms and Molecules (module 3), and Chemical Equilibria (module 4) have been passed with a grade $\geqslant$ 5.5.
2. For students who follow the two-bachelor's programme CSE and TN simultaneously (see article 6a), the additional requirements that students must meet, as intended in Article 6.2 paragraph 2 of the general section of the Education and Examination Regulations, are different, because they have a different first year. These students must have completed at least three of these four study units: Calculus 1 (202001215), Calculus 2 (202001224), Thermodynamics (202100105), and Linear Algebra (202001211).

Article 12 Quality assurance

1. Quality assurance is the total of all activities and processes that a study programme organizes to ensure, evaluate, improve and justify the quality of education in a structural manner, with the aim that education is carried out that meets or exceeds the predetermined (intended) quality requirements.
2. The programme director is responsible for the quality of the content and the structure and organisation of the study programme, including the organisation and execution of quality assurance such as evaluating the programme.
3. The quality assurance is coordinated by the quality assurance coordinator of the Faculty of Science & Technology (Science & Technology cluster). The quality assurance coordinator advises the programme (staff) on the internal quality assurance.
4. The CSE Quality Assurance Committee (QAC), consisting of students is tasked by the programme director with the execution of (aspects of) quality assurance, such as the evaluation of the programme.
5. The following instruments are used for internal quality assurance:
   a) panel meetings with students;
   b) web surveys about entire modules or study units (the Science & Technology Experience Questionnaire (STEQ));
   c) quantitative results, such as pass rates;
   d) lecturer panel meetings with module lecturers and representatives of the student panel meeting, in which all evaluation results mentioned under a-c are discussed.
6. The outcomes of internal quality assurance efforts are published as follows:
   a) An evaluation report is drawn up for each module, based on the minutes of the lecturer panel meeting specified in paragraph 5e. This evaluation report is shared with the relevant lecturers, staff members involved in the study programme, and the programme committee;
   b) Quantitative results, summaries of web surveys and evaluation reports are published on the Canvas course CSE Quality assurance and evaluation, which is accessible to all students and lecturers of the Chemical Science & Engineering degree programmes.
7. The following internal and external evaluations are used to evaluate the curriculum and the degree programme as a whole:
   a) the exit survey for the entire bachelor's programme;
   b) the National Student Survey (NSE)[6].
8. The programme director draws up an improvement plan annually when needed, based on internal and external evaluations, as well as on new insights.
   a) The improvement plan is discussed with the programme committee;

[6] The NSE is conducted annually.

b) the improvement plan is included in the faculty's annual plan;
c) the faculty's annual plan is discussed by the dean and the portfolio holder for education with the Executive Board in their autumn meeting.

Article 13 Changes and transitional arrangement

1. If the study programme included in Article 6 of this programme-specific part is altered or one of the other articles included in the general section or this programme-specific part is changed, the programme director will draw up and publish a transitional arrangement.
2. Article 8.4 of the general section sets out the conditions and requirements that a transitional arrangement must meet.
3. The transitional arrangement will also be published on the website of the Chemical Science & Engineering degree programme.
4. In the event that changes are made to this programme-specific part, the provisions set out in Articles 8.3 and 8.4 of the general section apply.

Article 14 Entry into force

This programme-specific part will come into effect on 1 September 2024 and will replace the programme-specific part dated 1 September 2023.

Adopted by the board of the faculty of Science and Technology in consultation with the Programme Committee for Chemical Science & Engineering, with the consent of the Faculty Council with Articles 7 and 11 and with the consent of the Programme Committee for Chemical Science & Engineering with Articles 4, 6, 8 and 12.