Subject-specific regulations for the master course Sustainable Chemistry of 5 March 2026 (Study Model 2011)

- Reading version -

The versions published in the Bielefeld University Gazette – Official Announcements – shall be binding.

Based on §§ 2 (4) and 64 (1) of the Higher Education Act of the State of North Rhine-Westphalia (Higher Education Act - HG) of 16 September 2014 (GV. NRW. p. 547), last amended by Article 2 of the Act of 19 December 2024 (GV. NRW. p. 1222), the Faculty of Chemistry, in conjunction with the Examination and Study Regulations for the Master course (MPO fw. - Study Model 2011) at Bielefeld University of 18 December 2020 (Bielefeld University Gazette - Official Announcements - Vol. 49 No. 16 p. 288), enacted these subject-specific regulations (Annex to Section 1 (1) MPO fw.):

1. **Master's degree (§ 3 MPO fw.)**
   The Faculty of Chemistry offers the degree programme Sustainable Chemistry with the degree "Master of Science" (M.Sc.).

2. **Further access requirements (§ 4 (1)-(4) MPO fw.)**
   The subject-specific regulations govern further access requirements in addition to the requirements resulting from § 49 of the NRW Higher Education Act and § 4 MPO fw. Applicants who meet all requirements shall receive access; applicants who do not meet all requirements shall not receive access.

   (1) Further approval requirements are proof of a previous qualified degree (§ 49 (6) sent. 3 HG NRW) in accordance with paragraph 2, language skills in English at level B2 of the European Framework of Reference for Languages in accordance with the guidelines of Bielefeld University and participation in an interview to which applicants may be invited if the documents do not allow a clear assessment of the requirements. The aim of the interview is for the university to understand the subject requirements in Chemistry and Physics completed in the previous degree; there is no re-examination of knowledge.

   (2) A degree is qualified if all of the following subject requirements are proven by academic achievements, i.e. one point is achieved in each case and two points are achieved in total:
   - Ability to work independently on a problem from the respective subject (Chemistry or Physics) using scientific methods within a given period of time – proven by a final thesis in the degree programme: 0-1 points;
   - In-depth knowledge of Chemistry or Physics, proven by 120 ECTS or a corresponding total workload: 0-1 points.

   The following points are awarded:
   0 points: the required competences are not present.
   1 point: the required competences are present.
   The benchmark for the knowledge and skills required for the master course are the competences taught in the Bachelor's degree courses in Sustainable Chemistry, Chemistry and Physics at Bielefeld University, as the Master course is conceptually based on these.
   Points are awarded for competences under consideration of the requirements for crediting (§ 21 of the examination regulations of Bielefeld University of 18 December 2020) and the associated applicable standards and guidelines, including those of the European Area of Recognition Project (http://ear.enic-naric.net/emanual/), according to the following criteria:
   - Quality of the university or degree (accreditation)
   - Level of competences acquired (qualification framework)
   - Workload
   - Profile / alignment of the completed degree
   - Specific learning outcomes under consideration of learning objective taxonomies

   (3) Examination of the requirements and prerequisites for both the access and the admission procedure shall be performed based on the following documents, to be uploaded and entered in the corresponding application portal of Bielefeld University in due time:
   a) Leaving certificate of a previous qualified degree and the corresponding degree documents (transcript, transcript of records, diploma supplement or similar) or provisional leaving certificate showing a provisional final grade.
   b) Module handbook or module descriptions for the modules completed

If no diploma supplement, transcript or module handbook or no module descriptions are available, corresponding descriptions that provide information on the completed degree programme, the competences acquired, the academic achievements and their evaluations, and on the individual subject profile of the completed degree programme are to be uploaded.
In addition, information on the criteria in accordance with paragraph 2 being met and on language skills shall be provided in the application portal.
Only pdf files will be accepted in the application portal. They should be searchable as far as possible.
Documents submitted after the application deadline or by any other means will not be considered.

(4) The access shall be evaluated by an authorised examiner. Applicants shall be informed about the result of the access procedure in an electronic notice. If applicants raise justified objections to the evaluation within one week, the decision shall be reviewed. Another authorised examiner shall be consulted for this purpose. The evaluation shall be corrected if necessary. Irrespective of this, there is the possibility of legal protection, which will be communicated in the instructions on the legal right to appeal of the notice.

(5) The responsible body in accordance with § 14 MPO fw. shall decide on whether the access requirements are met. It shall also regulate further details of the procedure, appoint the authorised examiners, set the application deadlines and make all decisions in connection with the access procedure.

3. Admission procedure (§ 4 (5) MPO fw.)

(1) Once it has been determined that the approval requirements have been met, the number of applicants for a master's course with restricted admission will be checked to see whether the number of available places exceeds the number of applicants who have been granted admission in accordance with item 2. If this is not the case, all of these applicants will be admitted.

(2) If the number of applicants who have been granted admission in accordance with item 2 exceeds the number of places available, the study places shall be allocated in the order of the number of points achieved in accordance with paragraph 3. If there is a tie, the lot decides. In the event of a further succession procedure, the regulations apply accordingly.

(3) The order is determined according to the following criteria and the total number of points achieved:

a. (provisional) final grade of the qualifying degree:
Grade 1.0 - 1.5: 4 points
Grade 1.6 - 2.0: 3 points
Grade 2.1 - 2.5: 2 points
Grade 2.6 - 3.0: 1 point
from grade 3.1: 0 points

b. Knowledge of chemical laboratory practice in accordance with the standards in item 2, paragraph 2:
45 ECTS or more: 2 points
20-45 ECTS: 1 point
less than 20 ECTS: 0 points

c. Theoretical knowledge of Organic and Anorganic Chemistry in accordance with the standards in item 2, paragraph 2:
30 ECTS or more: 2 points
15-30 ECTS: 1 point
less than 15 ECTS: 0 points.

(4) The evaluation of the admission criteria in accordance with paragraph 3 is carried out by an authorised examiner appointed by the competent body in accordance with § 14 MPO fw. Admission shall be granted by the student office on the basis of the number of points achieved. Applicants will be informed about the result of the admission procedure in an electronic notice from the student office.

4. Commencement of the degree programme before acquiring the access requirements (§ 4 (6) MPO fw.)

- not applicable -

5. Course start (§ 5 (1) MPO fw.)

The degree programme can be commenced in the winter semester.

6. Curriculum (§ 7 MPO fw.)

a. Subject-specific basis

Abbreviation	Module title	Recommended academic semester, start	CP	Necessary prerequisites
21-SC-3	Chemical Perspective on Planetary Boundaries and Food	1.	5	
21-SC-4	Chemistry of Energy Conversion and Storage	1.	10	
21-SC-5	Environmental Chemistry and Climate Science	1.	10	
21-SC-6	Life Cycle Assessment	1.	5	
Compulsory elective area I (30 CP) 30 CP must be studied. The modules to be studied are determined by the faculty before the course start. The knowledge and skills acquired during the Bachelor's degree programme are decisive for this decision. (1) If less knowledge in chemical laboratory practice than 45 CP and less knowledge in organic and inorganic chemistry than 30 CP can be proven, some or several of the modules 21-SC-20, 21-SC-21, 21-SC-22, 21-SC-23, 21-SC-24 and 21-SC-25 are studied. (2) If this knowledge has been proven, the modules 21-SC-1 and 21-SC-2 are studied. A combination of (1) and (2) is possible, with a maximum of 30 ECTS modules. A maximum of 15 CP are available as individual subsidiary subjects in accordance with § 7 p. 3 MPO fw. and § 9 MPO fw.				
21-SC-20	Guided Learning in Inorganic Chemistry for Alignment	1. o. 2. o. 3.	5	
21-SC-21	Guided Learning in Organic Chemistry for Alignment	1. o. 2. o. 3.	5	
21-SC-22	Guided Learning in Physical Chemistry for Alignment	1. o. 2. o. 3.	5	
21-SC-23	Lab Course in Inorganic Chemistry for Alignment	1. o. 2. o. 3.	5	
21-SC-24	Lab Course in Organic Chemistry for Alignment	1. o. 2. o. 3.	5	
21-SC-25	Lab Course in Physical Chemistry for Alignment	1. o. 2. o. 3.	5	
21-SC-1	Sustainable Materials and their Synthesis I	1.	10	30 ECTS in theoretical knowledge in Organic and Inorganic Chemistry and 20 ECTS in chemical laboratory practice
21-SC-2	Sustainable Materials and their Synthesis II	2.	5	30 ECTS in theoretical knowledge in Organic and Inorganic Chemistry and 20 ECTS in chemical laboratory practice
Individual subsidiary subjects (§ 7 p. 3, § 9 MPO fw.) Up to 15 CP of individual module elements (usually courses) can be included in the individual subsidiary subjects, provided that other modules do not have to be studied as a priority.			15	
Subtotal			60	

Further information on the modules can be found in the module structure table under 7. and in the module descriptions.

Abbreviation	Module title	Recommended academic semester, start	CP	Necessary prerequisites
Compulsory elective area II (5 CP) One of the modules 21-SC-7, 21-SC-8 and 21-SC-9 has to be studied.				
21-SC-7	Case Study Life Cycle Assessment	2.	5	Module 21-SC-6
21-SC-8	Environmental Analytics	2.	5	20 ECTS in chemical laboratory practice
21-SC-9	Special Synthesis Methods	2.	5	45 ECTS in chemical laboratory practice
Compulsory elective area III (20 CP) One module Research Project A and one module Research Project B has to be studied.				
21-SC-10	Research Project A: Chemistry of Energy	3.	10	
21-SC-11	Research Project A: Environment and Climate	3.	10	
21-SC-12	Research Project A: Synthesis	3.	10	45 ECTS in chemical laboratory practice
21-SC-13	Research Project A: Planetary Boundaries and Food	3.	10	
21-SC-14	Research Project B: Chemistry of Energy	3.	10	
21-SC-15	Research Project B: Environment and Climate	3.	10	
21-SC-16	Research Project B: Synthesis	3.	10	45 ECTS in chemical laboratory practice
21-SC-17	Research Project B: Planetary Boundaries and Food	3.	10	
21-SC-18	Chemistry in Modern Society	3.	5	
21-SC-19	Master's Thesis	4.	30	90 CP must have been taken during the course of study.
Total			**120**	

Further information on the modules can be found in the module structure table under 7. and in the module descriptions.

7. Module structure table

Abbreviation	Title	CP	Necessary prerequisites	Number of study requirements	Number of graded (partial) module examinations	Weighting of partial module examinations	Number of ungraded (partial) module examinations
21-SC-1	Sustainable Materials and their Synthesis I	10	30 ECTS in theoretical knowledge in Organic and Inorganic Chemistry and 20 ECTS in chemical laboratory practice		1		
21-SC-10	Research Project A: Chemistry of Energy	10		1			1
21-SC-11	Research Project A: Environment and Climate	10		1			1
21-SC-12	Research Project A: Synthesis	10	45 ECTS in chemical laboratory practice	1			1
21-SC-13	Research Project A: Planetary Boundaries and Food	10		1			1
21-SC-14	Research Project B: Chemistry of Energy	10		1			1
21-SC-15	Research Project B: Environment and Climate	10		1			1
21-SC-16	Research Project B: Synthesis	10	45 ECTS in chemical laboratory practice	1			1
21-SC-17	Research Project B: Planetary Boundaries and Food	10		1			1
21-SC-18	Chemistry in Modern Society	5					1
21-SC-19	Master's Thesis	30	90 CP must have been taken during the course of study.		1		
21-SC-2	Sustainable Materials and their Synthesis II	5	30 ECTS in theoretical knowledge in Organic and Inorganic Chemistry and 20 ECTS in chemical laboratory practice		1		
21-SC-20	Guided Learning in Inorganic Chemistry for Alignment	5					1
21-SC-21	Guided Learning in Organic Chemistry for Alignment	5					1
21-SC-22	Guided Learning in Physical Chemistry for Alignment	5					1
21-SC-23	Lab Course in Inorganic Chemistry for Alignment	5					1
21-SC-24	Lab Course in Organic Chemistry for Alignment	5					1
21-SC-25	Lab Course in Physical Chemistry for Alignment	5					1
21-SC-3	Chemical Perspective on Planetary Boundaries and Food	5			1		
21-SC-4	Chemistry of Energy Conversion and Storage	10			1		

21-SC-5	Environmental Chemistry and Climate Science	10			1		
21-SC-6	Life Cycle Assessment	5			1		
21-SC-7	Case Study Life Cycle Assessment	5	Modul 21-SC-6				1
21-SC-8	Environmental Analytics	5	20 ECTS in chemical laboratory practice				1
21-SC-9	Special Synthesis Methods	5	45 ECTS in chemical laboratory practice				1

8. Further information on the module examinations, partial module examinations and study requirements as well as the Master's thesis

(1) Module examinations or partial module examinations shall be taken in one of the following forms:

- Written examination at a scope of 90 to 120 minutes,
- Oral examination at a scope of 30 to 45 minutes,
- Presentation, the scope of which is agreed at the beginning of the course,
- Portfolio of experiments, the elements of which are examined during the course. Examination components for an experiment are completed one after the other:
  1. Review of prior knowledge including safety-relevant aspects,
  2. Carrying out the experiment and recording the experimental procedure, observations and results,
  3. Preparation of a written experiment protocol or an oral presentation of the results,
  4. Discussion of the experiment protocol, the results and the theory of the experiment (abtestation).

  Subsequent elements of the experiment can only be started if the previous elements have been passed. For individual experiments, individual elements may be omitted or, in relation to point 2, replaced by theorised elements after appropriate notification. An attempt is passed if all four elements have been completed and fulfil the requirements despite existing deficiencies.
  If an element of an experiment is not passed, there are two options:
  a) The entire test can be repeated or
  b) individual elements can be repeated if elements have already been evaluated as "passed" and individual learning objectives of the attempt have been achieved.
  This is decided by the authorised examiner.
  The experiment or individual elements of an experiment can be repeated a maximum of once in this way. A total of two experiments can be repeated per practical course and portfolio in the aforementioned sense.
- Portfolio consisting of a research plan, carrying out of experiments and recording of observations and results and preparation of a written report of a maximum of 30 pages and presentation of the results.
- Project with elaboration: As part of the seminar, an exemplary life cycle assessment is carried out individually, in groups or in plenary sessions. The object of the life cycle assessment will be agreed at the beginning of the course. The presentation of the results takes place at the end of the seminar in the plenum, where the results achieved are presented and critically discussed. This approx. 15 to 25 minute presentation is accompanied by media such as a poster, slides or a blackboard.

Other forms, in particular those for the demonstration of interdisciplinary competences including media competence, are possible. The workload and qualification requirements must be comparable. Further details can be found in the module descriptions.

(2) Study requirements in the Sustainable Chemistry degree programme serve to deepen the topics covered, to practise methods of oral or written presentation and to prepare for the module examination.
A 30-minute seminar presentation can be considered as study requirement.
Other forms are possible. When choosing other forms, the objective of the study requirement and the specified scope must be taken into account. Further details can be found in the module descriptions.

(3) The Master's thesis is an independent, written, academic paper. It is written in English or German and should not exceed 100 pages (excluding appendices). In addition to the evaluation of the presentation of content-related aspects such as motivation and introduction to the topic, theoretical principles, description of the work carried out, discussion of the results achieved and the choice of references, the grading should take into account an evaluation of the results achieved, compliance with good scientific practice and independence and creativity in dealing with the topic. The results are then presented in a 20 to 30-minute

seminar lecture. Students contact a supervisor for this purpose and discuss a possible task. The supervisor is responsible for issuing the final task. The processing time begins with this issue. At the same time, the supervisor and student must ensure immediate registration at the examination office, in particular to appoint the examiners and document the examination procedure. The processing time is 6 months. The thesis must be submitted to the examination office in due time. The Faculty of Chemistry shall provide separate information about the form (written/electronic).

9. Entry into force and scope of application

These subject-specific regulations shall enter into effect on 1 October 2026. They apply to all students who enrol on the Master's course in Sustainable Chemistry from the winter semester 2026/2027.

10. Exclusion of objections

The violation of procedural or formal regulations of the HG NRW or the university's regulatory or other autonomous law can only be asserted against these regulations within one year of their publication, unless

a) the regulations have not been properly publicised,
b) the Rectorate has previously objected to the resolution of the body adopting the regulations,
c) the formal or procedural defect has been notified to the university in advance, stating the violated legal provision and the fact that reveals the defect, or
d) the legal consequence of the exclusion of objection was not pointed out when the regulations were publicly announced.

The supervisory powers according to § 76 HG remain unaffected.

Issued on the basis of the resolution of the Faculty Conference of the Faculty of Chemistry at Bielefeld University of 14 January 2026.

Bielefeld, 5 March 2026

The Rector
of Bielefeld University
University Professor Dr Angelika Epple