Subject-specific regulations for the Master course in Data Science of 1 April 2026 (study model 2011)

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 Business Administration and Economics and the Faculty of Technology have enacted these subject-specific regulations (annex to § 1 (1) MPO fw.) 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 – yr. 49 no. 16 p. 288):

1. Master's degree (§ 3 MPO fw.)

The Faculty of Business Administration and Economics and the Faculty of Technology jointly offer – subject to the organisational responsibility of the Faculty of Business Administration and Economics – the Data Science degree programme with the degree of “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 shall receive access if they meet all requirements; applicants shall not receive access if they do not meet all requirements.
(1) Further access requirements are proof of a previous qualified degree (§ 49 (6) sent. 2 HG NRW) in accordance with paragraph 2 and language skills in English at level B2 of the European Framework of Reference for Languages in accordance with the guidelines of Bielefeld University. German language skills are recommended for the general success of the study programme, but they are not mandatory.

(2) A degree shall be qualified if all of the following subject requirements are proven by academic achievements, i.e., at least one point is achieved in each case and a total of 6 of the 9 points are achieved.

Notice: Any further knowledge and qualifications acquired outside of the curriculum of the qualified degree may be considered when awarding points if this compensates for missing competences within the meaning of the criteria listed below.

Knowledge of computer science:
- 0 points: No required competences.
- 1 point: Advanced programming skills.
- 2 points: Additional user knowledge in at least two areas of computer science

Knowledge of mathematics:
- 0 points: No required competences.
- 1 point: Basic understanding of calculus and linear algebra

Knowledge of statistics:
- 0 points: No required competences.
- 1 point: Basic understanding of inferential statistics (specification, estimation & verification of statistical models; cf. module 31-M3 Statistics)
- 2 points: Understanding of advanced classical statistical analysis methods (e.g., time series analysis, Bayesian statistics, non-parametric statistics, econometrics, ...).

(Preliminary) final grade of the qualified degree from 1.00 to 1.59: 4 points

(Preliminary) final grade of the qualified degree from 1.60 to 2.59: 3 points

(Preliminary) final grade of the qualified degree from 2.60 to 3.59: 2 points

(Preliminary) final grade of the qualified degree from 3.60 to 4.00: 1 point

The benchmark for the necessary knowledge and skills for the Master course shall be the mathematical and statistical competences taught in the 1-subject Bachelor course in Economics at Bielefeld University (Data Science profile) as well as the competences in Computer Science taught in a Bachelor course at the Faculty of Computer Science at Bielefeld University, since the Master course concept is built 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/manual/) in accordance with the following criteria:
- Quality of the university or the degree (accreditation)
- Level of competences acquired (qualifications 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 into the corresponding application portal of Bielefeld University in time:

a) Final certificate of a previous qualified degree and the corresponding final documents (transcript, transcript of records, diploma supplement, or similar) or provisional final certificate showing a provisional final grade.

b) Module guide or module descriptions for the completed modules

If no diploma supplement, transcript, or module guide 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 following the deadline for applications or by any other means will not be considered.

(4) Access shall be evaluated from case to case by an authorised examiner. Applicants shall be informed about the result of the access procedure in an electronic notice. If the applicant raises an objection to the evaluation, including reasons, within one week, the decision shall be reviewed; two further authorised examiners shall be involved for this. The evaluation shall be corrected if necessary. Irrespective of this, legal protection shall be available. It will be communicated in the instruction on the legal right to appeal the notice.

(5) The competent body in accordance with § 14 MPO fw. shall decide on whether the access requirements are met; it shall also stipulate any further details of the procedure, appoint the authorised examiners, set the deadlines for applications, and make all decisions in connection with the access procedure.

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

(1) After determining whether the access requirements have been met, it will be determined whether the number of applicants who are granted access in accordance with item 2 exceeds the number of available places for Master courses with restricted admission. If this is not the case, all of these applicants will be admitted.

(2) If the number of applicants granted access in accordance with section 2 exceeds the number of available places, the study places shall be allocated in the order of the total number of points achieved in the procedure in accordance with item 2 paragraph 2 (i.e., points from the competences and the preliminary final grade). If there is a tie, the number of points achieved in the subject-related criteria (item 2, paragraph 2) shall be solely decisive; the points of the previous final grade shall not be considered. If this does not result in a clear ranking, the (preliminary) final grade of the degree qualifying for the Master course shall be decisive. If there is no clear ranking, lots shall be cast.

(3) Admission shall be granted by the Studierendensekretariat [Student Office] based on the ranking in accordance with paragraph 2. Paragraphs 2 and 3 shall apply accordingly if there is any further follow-up procedure.

(4) Applicants shall be informed about the result of the admission procedure in an electronic notice from the Studierendensekretariat [Student Office].

4. Starting a study programme before acquiring the access requirements (§ 4 (6) MPO fw.)

- not applicable -

5. Course start (§ 5 (1) MPO fw.)

The study programme can only be taken up in the winter semester.

6. Curriculum (§ 7 MPO fw.)

The modules shall be held in English.

a. Socket phase

There are two different versions of the course of study in the socket phase due to the interdisciplinary alignment of the degree programme and the associated different first degrees acquired. The decision on the socket phase to be studied shall be made under consideration of the first qualified degree within the scope of the access procedure (item 2, paragraph 8).
Version 1 shall generally be aimed at students with a Bachelor's degree from the field of economics/statistics or comparable degree programmes.
Version 2 shall generally be aimed at students with a Bachelor's degree from the field of computer science or comparable degree programmes.

aa. Version 1

Abbreviation	Module title	Subject related semester	CP	Necessary prerequisites
24-M-FStat	Foundations of Statistics	1.	7	
39-Inf-AOpt	Applied Optimisation	1.	5	
39-Inf-ML	Introduction to Machine Learning	1.	5	
39-Inf-Pro	Programming	1.	5	
39-Inf-BDA	Big Data Analytics	2.	5	
Subtotal			**27**	

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

bb. Version 2

Abbreviation	Module title	Subject related semester	CP	Necessary prerequisites
24-M-FStat	Foundations of Statistics	1.	7	
31-M-ISDA	Introduction to Statistical Data Analysis	1.	8	
39-Inf-AOpt	Applied Optimisation	1.	5	
31-M-Ectr1	Econometrics 1	2.	7	
Subtotal			**27**	

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

b. Profile phase

Abbreviation Title	Module	Subject related semester	CP	Necessary prerequisites
Compulsory optional subject area I /Electives I (10 CP)				
Modules at a scope of 10 CP from the module pool "Compulsory optional subject Advanced Machine Learning" must be studied.				
Compulsory optional subject area II /Electives II (16 CP)				
31-M-ASM1	Advanced Statistical Methods I	1.	8	
	or			
31-M-INT1	International Courses in Data Science 1	1.	8	Stay at a foreign university
	and			
31-M-ASM2	Advanced Statistical Methods II	2.	8	
	or			
31-M-INT2	International Courses in Data Science 2	2.	8	Stay at a foreign university
Compulsory optional subject area III /Electives III (20 CP)				
Modules at a scope of 20 CP from the module pool "Compulsory optional subject Advanced Machine Learning" must be studied.				
Compulsory area				
31-SW-StaFo	Topics in Contemporary Statistics	3.	5	
31-SW-StiP	Statistics in Practice	3.	7	
39-Inf-ELSI	Ethical, Legal and Social Impacts	3.	5	
31-M-Thesis	Master's Thesis	4.	30	
Total			**120**	

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

Module pool "Compulsory optional subject Advanced Machine Learning"

Abbreviation	Module title	CP	Subject related semester	Necessary prerequisites
31-M-Inf-KIDL	Advanced Artificial Intelligence & Deep Learning (Basics)	5	1. o. 2. o. 3.	
39-M-Inf-KIDL-x	Advanced Artificial Intelligence & Deep Learning (Focus)	10	1. o. 2. o. 3.	
39-M-Inf-MLDM	Advanced Machine Learning and Data Mining (Basics)	5	1. o. 2. o. 3.	
39-M-Inf-MLDM-x	Advanced Machine Learning and Data Mining (Focus)	10	1. o. 2. o. 3.	
39-Inf-NN	Introduction of Neural Networks	5	2.	

Module pool “Compulsory optional subject computer science”
Modules not yet studied must be selected.

Abbreviation	Module title	CP		Necessary prerequisites
39-Inf-WP-CIT	Cognitive Interaction Technology (Basics)	5	2. o. 3.	
39-Inf-WP-DS	Data Science (Basics)	5	2. o. 3.	
39-Inf-WP-DS-x	Data Science (Focus)	10	2. o. 3.	
39-Inf-WP-IS	Information Systems (Basics)	5	2. o. 3.	
39-Inf-WP-KI	Artificial Intelligence (Basics)	5	2. o. 3.	
39-Inf-WP-MC	Media Computing (Basics)	5	2. o. 3.	
39-M-Inf-DS	Advanced Data Science (Basics)	5	2. o. 3.	
39-M-Inf-DS-x	Advanced Data Science (Focus)	10	2. o. 3.	
39-M-INT1	International Courses in Data Science 1	5	2. o. 3.	Stay at a foreign university
39-M-INT2	International Courses in Data Science 2	5	2. o. 3.	Stay at a foreign university
39-M-INT3	International Courses in Data Science 3	5	2. o. 3.	Stay at a foreign university
39-M-INT4	International Courses in Data Science 4	5	2. o. 3.	Stay at a foreign university
39-M-INT5	International Courses in Data Science 5	10	2. o. 3.	Stay at a foreign university
39-M-INT6	International Courses in Data Science 6	10	2. o. 3.	Stay at a foreign university

7. Module structure table

Abbreviation	Title	CP	Necessary prerequisites	Number of study requirements	Number of graded (partial) module	Weighting of partial module examinations	Number of ungraded (partial) module
24-M-FStat	Foundations of Statistics	7			1		
31-M-ASM1	Advanced Statistical Methods I	8			1		
31-M-ASM2	Advanced Statistical Methods II	8			2	1:1	
31-M-Ectr1	Econometrics 1	7			1		
31-M-INT1	International Courses in Data Science 1	8	Stay at a foreign university		1		
31-M-INT2	International Courses in Data Science 2	8	Stay at a foreign University		1		
39-M-INT1	International Courses in Data Science 1	5	Stay at a foreign University		1		
39-M-INT2	International Courses in Data Science 2	5	Stay at a foreign University		1		
39-M-INT3	International Courses in Data Science 3	5	Stay at a foreign university		1		
39-M-INT4	International Courses in Data Science 4	5	Stay at a foreign university		1		
39-M-INT5	International Courses in Data Science 5	10	Stay at a foreign University		1		
39-M-INT6	International Courses in Data Science 6	10	Stay at a foreign University		1		
31-M-ISDA	Introduction to Statistical Data Analysis	8			1		
31-M-Thesis	Master's Thesis	30			1		
31-SW-StaFo	Topics in Contemporary Statistics	5		1	1		
31-SW-StiP	Statistics in Practice	7		1	1		
39-Inf-AOpt	Applied Optimisation	5			1		
39-Inf-BDA	Big Data Analytics	5			1		
39-Inf-ELSI	Ethical, Legal and Social Impacts	5			1		
39-Inf-ML	Machine Learning Basics	5			1		
39-Inf-NN	Introduction of Neural Networks	5			1		
39-Inf-Pro	Programming	5			1		
39-Inf-WP-CIT	Cognitive Interaction Technology (Basics)	5			1		
39-Inf-WP-DS	Data Science (Basics)	5			1		
39-Inf-WP-DS-x	Data Science (Focus)	10			2	1:1	
39-Inf-WP-IS	Information Systems (Basics)	5			1		
39-Inf-WP-KI	Artificial Intelligence (Basics)	5			1		
39-Inf-WP-MC	Media Computing (Basics)	5			1		
39-M-Inf-DS	Advanced Data Science (Basics)	5			1		

39-M-Inf-DS-x	Advanced Data Science (Focus)	10			2	1:1	
39-M-Inf-KIDL	Advanced Artificial Intelligence & Deep Learning (Basics)	5			1		
39-M-Inf-KIDL-x	Advanced Artificial Intelligence & Deep Learning (Focus)	10			2	1:1	
39-M-Inf-MLDM	Advanced Machine Learning and Data Mining (Basics)	5			1		
39-M-Inf-MLDM-x	Advanced Machine Learning and Data Mining (Focus)	10			2	1:1	

8. Further information on 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 (e-)exam at a scope of 30 to 60 minutes,
- Written exam at a scope of 90 to 120 minutes,
- Oral (e-)exam at a scope of 15 to 20 minutes,
- Oral presentation at a scope of 15 minutes with a written paper at a scope of 15 pages
- Portfolio: Portfolio of exercises and/or programming tasks that are issued course-specifically from case to case. Review of the exercises/programming tasks shall also include direct questions on the solution approaches, which the students have to answer in the exercises. The organiser may require individual explanation and demonstration of tasks or replace part of the exercises or programming tasks with classroom exercises. The tasks shall usually be handed out on a weekly basis.
- Portfolios with final exams: Portfolios with final exams may specifically comprise the following elements:
    - Portfolio of exercises or programming tasks that are issued course-specifically (passed at 50% of the possible points). Review of the exercises programming tasks shall also include direct questions on the solution approaches, which the students have to answer in the exercises. The organiser may require individual explanation and demonstration of tasks or replace part of the exercises or programming tasks with classroom exercises. The tasks shall usually be handed out on a weekly basis. Further specification is possible in the module description.
    - Final written exams at a scope of 60 to 90 minutes or 90 to 180 minutes, also possible as e-exams, openBook exams, or e-openBook exams; openBook exams have a scope of 120 to 180 minutes.
    - Oral final exams at a scope of 15 to 25 minutes or oral exam of 20 to 40 minutes
    - Project with elaboration: as final portfolio exam: Programming project and elaboration of a project report of 3 to 4 pages
    - Oral presentation with elaboration: as final portfolio exam: Oral presentation at a scope of 30 to 45 minutes with a written paper at a scope of 5 to 10 pages
    - Essay as a final portfolio exam at a scope of 4 pages
- Project with elaboration: Final report (5 to 10 pages) regarding a completed project and presentation of the results at a scope of 20 to 45 minutes.

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.

(1a) The final exam in portfolio examination results can also be held in electronic form. A Safe Exam Browser (SEB) may be used additionally for electronic written exams and electronic final exams in the scope of portfolios with written final exams (depending on the examination type at hand). It will be installed on the respective devices for this.

(2) Study requirements in the Data Science degree programme are to ensure the acquisition of competences and knowledge in the respective modules as well as to practise and apply the acquired theoretical and methodological knowledge to concrete problems and to document the results achieved in summary form. Furthermore, they may serve communicative (written and/or oral) practice and learning of the competence to be acquired with a focus on the interaction situation of a seminar.

The following may be considered as study requirements:

- A brief written elaboration at a scope of 1 to 2 pages and active contributions to the research colloquium;

- Internship report (usually between 3 and 5 pages) or written paper (usually between 10 and 15 pages) on the contents of the theory-in-practice course.

Other forms are possible. When choosing other forms, the aim of the study requirements and the specified scope must be considered. Further details can be found in the module descriptions.

(3) The Master's thesis shall be a written paper. The processing time shall be six months. The date of issue shall be recorded. The length of the thesis shall usually be between 40 and 80 pages. The topic and assignment must be such that it can be completed within the intended workload of 30 credit points (900 hours). The theses in electronic form (as searchable PDF file with declaration on independent completion, including scanned signature) must be emailed to the examination office of the Faculty of Business Administration and Economics as well as to both reviewers (open distributor). Submission must use the uni account (email address: @uni-bielefeld.de). The Master's thesis cannot be completed as a group work. Any staff of the Faculty of Business Administration and Economics and the Faculty of Technology who hold doctorates and any staff of the Faculties of Mathematics and Physics who hold doctorates may serve as supervisors. Staff of other faculties of Bielefeld University who hold doctorates may be chosen as one of the examiners by the person responsible for the module in the scope of registration of the Master's thesis. At least one examiner must be from the group of professors of the Faculty of Business Administration and Economics or the Faculty of Technology. Other rules result from the Master's examination rules.

9. Entering into effect and scope of application

(1) These subject-specific regulations shall enter into effect on 1 October 2026. They shall apply to all students enrolling in the Master course Data Science from the winter semester 2026/2027 onwards.

(2) Students who were enrolled for the course in Data Science of at Bielefeld University before the winter semester 2026/2027 may complete their study programme based on the subject-specific regulations for the Master course in Data Science of 6 April 2018 (Bielefeld University Gazette – Official Announcements – yr. 47 no. 8 p. 50), last amended on 10 December 2024 (Bielefeld University Gazette – Official Announcements – yr. 53 no. 13 p. 209) until the end of the summer semester 2028. Upon commencement of the winter semester 2028/2029, the students named in sentence 1 will also be subject to these subject-specific regulations. The dean of the Faculty of Business Administration and Economics will decide on the eligibility of any academic achievements completed by that time.

(3) Upon the student's application, these subject-specific regulations shall also be applicable to students under (2). The application shall be irrevocable.

10. No complaints

Claims from violation of any procedural or formal rules of the HG NRW or the university's regulatory or other autonomous law by these rules can only be asserted within one year of their publication, except if

a) the rules have not been duly published,
b) the rectorate has previously objected to the decision of the body adopting the rules,
c) the university has been notified of the formal or procedural defect in advance and the violated legal provision and the fact giving rise to the defect have been designated in the course of this, or
d) the legal consequence of the exclusion of complaint was not referred to in the public announcement of the rules.

The supervisory authorisations under § 76 HG shall not be affected by this.

Executed based on the resolution of the Faculty Conference of the Faculty of Business Administration and Economics at Bielefeld University of 3 December 2025 and the resolution of the Faculty Conference of the Faculty of Technology of Bielefeld University of 28 May 2025.

Bielefeld, 01 April 2026

The rector
of Bielefeld University, University
Professor Dr. Angelika Epple