



Studien- und Prüfungsordnung

Master of Science

Civil Systems Engineering

Please note that this is an **unofficial translation** of the Study and Examination Regulations.
In case of inconsistency between the German and the English version, the German version of the agreement prevails.

	AMBI.
Study and Examination Regulations	8/2020
Application and Admission Regulations	8/2020

I. Legal and Administrative Provisions

Faculties

Study and Examination Regulations for the International Consecutive Master's Program in Civil Systems Engineering at Faculty VI of Technische Universität Berlin

of 16 October 2019

On 16 October 2019, the Faculty Board of Faculty VI of Technische Universität Berlin, pursuant to Section 18 (1) no. 1 of the Constitution of Technische Universität Berlin, Section 71 (1) no. 1 of the Berlin State Higher Education Act (*Berliner Hochschulgesetz - BerHGG*) in the version of 26 July 2011 (Gazette of Laws and Ordinances p. 378), last amended by Article 6 of the Act of 2 February 2018 (Gazette of Laws and Ordinances p. 160), adopted the following study and examination regulations for the Civil Systems Engineering master's program.*

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I. General regulations

Section 1 – Scope of application

These study and examination regulations govern both the objectives and organization of studies, and the requirements and conducting of examinations in the master's program in Civil Systems Engineering. The program-specific provisions included herein supplement the Regulations Governing General Study and Examination Procedures of Technische Universität Berlin (*Ordnung zur Regelung des allgemeinen Studien- und Prüfungsverfahrens - AllgStuPO*).

Section 2 – Entry into force

These regulations shall enter into force on the day after their publication and apply to students enrolling from the 2020/21 winter semester onwards.

II. Program objectives and structure

Section 3 – Learning outcomes, program content, and professional fields

(1) Building on a bachelor's program in civil engineering, architecture, or an equivalent degree program, the master's study program in Civil Systems Engineering is an international degree program that qualifies students for professional work in national and international engineering offices, construction firms, and public administration. In addition, the degree program qualifies students for work in international scientific and industrial research. Following completion of their master's degree, graduates are able to design independent complex engineering projects using modern digital methods and carry out larger design and research work and manage these in a team. A particular focus of the degree program is preparing international students for professional work with German employers.

(2) Upon successful completion of the master's program, graduates possess the following academic and practical knowledge and skills:

- The necessary methodological skills to analyze complex building systems which meet sustainability and gender and diversity requirements and to analyze these systems within their economic, ecological, physical, and social context
- The natural science skills to design building systems using modern digital simulation methods with consideration for a large number of alternatives
- The ability to independently develop alternative solutions and strategies for practical or scientific problems
- The ability to solve complex design issues in a team and develop optimized, integrated design proposals
- Sufficient German language skills to work for a German employer

Section 4 – Program start, standard period of study, and required coursework

(1) The program starts in the winter semester.

(2) The standard period of study, including completing the master's thesis, is four semesters.

(3) The program encompasses 120 credit points (CP).

(4) Instruction and examinations are conducted in English. The compulsory elective component contains modules to teach students the requisite language skills for the German job market. Within the compulsory elective and elective components, students have the possibility to select modules in English and German.

(5) The teaching curriculum and the entire examination procedure are structured and organized in such a way as to enable students to complete the program within the standard period of study.

Section 5 - Program structure

(1) Students have the right to individually determine the order of progression of their own course of study. However, they are obliged to comply with the provisions of these study and examination regulations. The recommended sequence in which modules should be taken is shown in the proposed course schedule in Annex 2 of these regulations. This does not affect any possible constraints resulting from subject-specific admission requirements for modules.

* Approved by the TU Berlin Executive Board on 03-02-2020 and Senate Chancellery Higher Education and Research on 11-06-2020

(2) Students must achieve a total of 120 credit points, 90 of which are awarded for modules and 30 for the master's thesis.

(3) The compulsory component, including the master's thesis, is worth 60 credit points. The modules assigned to the different components can be found in the module catalog (Annex 1).

(4) The compulsory elective component is worth 36 credit points and is structured as follows: Development of basic engineering skills worth at least 18 credit points and Language skills worth a maximum of 18 credit points. The modules assigned to each category can be found in the module catalog (Annex 1).

(5) A total of 24 credits must be earned in elective modules. These modules allow students to acquire additional subject-specific and generic skills as well as expertise that qualifies them for a profession and can be selected from the full range of subjects offered by Technische Universität Berlin, other universities or higher education institutions with equal status within the jurisdiction of the Framework Act for Higher Education (*Hochschulrahmengesetz - HRG*) as well as at universities and higher education institutions abroad recognized as equivalent. It is recommended that students select interdisciplinary courses. These modules also include modules for learning foreign languages.

(6) The skills to be taught in each module, module examination requirements, and relevant admission requirements, if any, are updated annually in the form of program-specific module catalogs in accordance with Section 33 (6) AllStuPO and published at the beginning of the winter semester in October and at the beginning of the summer semester in April in the Official Gazette of Technische Universität Berlin.

III. Examination requirements and conduct of examinations

Section 6 – Purpose of the master's examination

The master's examination determines whether a candidate has achieved the learning outcomes according to Section 3 of these regulations.

Section 7 – Master's degree

On behalf of Faculty VI, Technische Universität Berlin awards the academic degree "Master of Science" (M.Sc.) to students who have passed the master's examination.

Section 8 – Scope of the master's examination, calculation of the overall grade

(1) The master's examination comprises the module examinations listed in the module catalog (Annex 1) and the master's thesis according to Section 9.

(2) According to the principles stipulated in Section 47 AllgStuPO, the overall grade is to be determined by combining the grades achieved for those examinations arising from modules taken from the module catalog that are marked both as graded and for inclusion in the overall grade together with the grade achieved for the master's thesis.

(3) The calculation of the overall grade is based on at least 75% of the student's overall performance (including the master's thesis), that is on the module grades of at least 90 credit points. Ungraded modules and modules with the lowest grades amounting to no more than 25% of the overall performance (30 credit points maximum) are not included. The grade of the master's thesis and of the compulsory modules, with the exception of the module "Project – Systems Engineering" are always included in the calculation of the overall grade. In the event that a student receives the same grade in different modules, the most recently completed module is not considered. Only fully completed modules are included in the calculation of the grade. Grades excluded from the calculation of the overall grade are identified accordingly on the final certificate. The

grades of all modules are listed on the final certificate.

Section 9 – Master's thesis

(1) The master's thesis is usually completed in the fourth degree semester. It is worth 30 credit points and consists of a written paper and subsequent oral component in the form of a 20 to 30-minute presentation and a defense lasting no longer than 30 minutes.

(2) The written thesis is to be submitted at the latest 20 weeks after the topic has been assigned. In the event of significant reasons beyond the student's control preventing the completion of the thesis within this time frame, the examination board shall grant an extension for as long as the reasons in question continue to apply, but only for a maximum of 20 weeks. Should the respective reasons continue to apply beyond the maximum extension period, the student may withdraw from the examination. The presentation with defense is to be held within four weeks of submission of the written thesis.

(3) To apply for admission to the master's thesis, students must present proof of successfully completed module examinations, worth at least 54 credit points and including all compulsory modules, to the responsible department of the Central University Administration. Proof of sufficient German skills at B1 level must also be presented.

(4) The topic of the master's thesis may be rejected once, however only within the first four weeks of being assigned by the responsible department in the Central University Administration.

(5) The procedures for applying for admission to and assessment of a final thesis are regulated in the current version of the Regulations Governing General Study and Examination Procedures (AllgStuPO).

(6) At least one assessor must be a university professor at TU Berlin. Persons with experience in professional practice and training can be appointed as secondary examiners of final theses if they have a master's degree or an equivalent university degree.

Section 10 – Types of examination and registration for examinations

(1) The types of examination and the registration procedure for module examinations are regulated by the current version of the Regulations Governing General Study and Examination Procedures (AllgStuPO).

(2) For compulsory elective or elective modules studied at other faculties or institutions of higher education, the types of examination specified in the module descriptions shall apply.

IV. Annexes

Annex 1: Module catalog

Annex 2: Sample Course Schedule

Annex 1: Module Catalog¹

Compulsory Courses

Course title	Credit points	Type of examination	Graded	Weighting ²
Agile systems engineering	6	Portfolio assessment	Yes	1.0
Modelling civil engineered systems	6	Portfolio assessment	Yes	1.0
Multi-physics approaches for modeling civil systems	6	Portfolio assessment	Yes	1.0
Whole life civil systems analysis	6	Portfolio assessment	Yes	1.0
Project – Civil systems engineering	6	Portfolio assessment	Yes	0.0

Compulsory elective courses: Development of basic engineering skills (at least 18 CP)

Course title	Credit points	Type of examination	Graded	Weighting
Geometry models in civil engineering informatics	6	Portfolio assessment	Yes	1.0
Geotechnical earthquake engineering	6	Oral examination	Yes	1.0
Modeling hydro- and environmental systems	6	Oral examination	Yes	1.0
Project - Water resources management and modeling of hydrosystems	6	Portfolio assessment	Yes	1.0
Project - Geotechnical engineering	6	Portfolio assessment	Yes	1.0
Project - Civil engineering informatics	6	Portfolio assessment	Yes	1.0
Specific topics of hydro- and environmental engineering (a)	6	No examination	No	0.0
Water resources management	6	Portfolio assessment	Yes	1.0

Compulsory elective courses: Language skills (maximum 18 CP)*

*The modules for the acquisition of German language skills are only intended to teach students without a German university entrance qualification certificate or German-language first university degree the requisite language skills for the German job market.

Course title	Credit points	Type of examination	Graded	Weighting
German - for students (A1)	6	Portfolio assessment	Yes	1.0
German - for students (A2)	6	Portfolio assessment	Yes	1.0
German - for students (B1)	6	Portfolio assessment	Yes	1.0
German - for students (B2)	6	Portfolio assessment	Yes	1.0
Technical English for natural and engineering sciences (C1)	6	Portfolio assessment	Yes	1.0

Electives (24 CP)

Course title	Credit points	Type of examination	Graded	Weighting
Dependent on student's choice	24	Dependent on student's choice		1.0

¹ The module descriptions are published annually in the Official Gazette of TU Berlin at the beginning of the winter semester in October and at the beginning of the summer semester in April. The version published therein is then valid. (See Section 33 (6) of the Regulations Governing Study and Examination Procedures (AllgStuPO)).

² "1" means that the grade is weighted on the scale of CP (Section 47 (6) AllgStuPO); "0" means the grade is not weighted; all other figures are a multiplication factor for the scale in CP. For further details, see Section 8 (3) of these regulations.

Annex 2: Sample Course Schedule

1st Semester	2nd Semester	3rd Semester	4th Semester
Compulsory modules totaling 60 CP			
Modeling civil engineered systems 6 CP	Agile systems engineering 6 CP	Project – Civil systems engineering 6 CP	Master's thesis 30 CP
Multi-physics approaches for modeling civil systems 6 CP			
Whole life civil systems analysis 6 CP			
Compulsory elective courses totaling 36 CP			
Modules can be selected from the areas “Development of basic engineering skills” totaling at least 18 CP and “Language skills” totaling no more than 18 CP. The modules assigned to the different components can be found in the module catalog.			
Elective courses totaling 24 CP			
Students may choose modules from the full range of subjects offered by Technische Universität Berlin, other universities or higher education institutions with equal status within the jurisdiction of the Framework Act for Higher Education (HRG) as well as at universities and higher education institutions abroad recognized as equivalent.			

In principle, a stay abroad is possible. The third semester is recommended as a mobility window. The program can be completed part-time. The respective advisory services can assist with drawing up an individual degree schedule.

Application and Admission Regulations for the International Consecutive Master's Program in Civil Systems Engineering at Faculty VI of Technische Universität Berlin

of 16 October 2019

On 16 October 2019, the Faculty Board of Faculty VI of Technische Universität Berlin, in accordance with Section 18 (1) no. 1 of the Constitution of Technische Universität Berlin in conjunction with Section 10 (5) of the Berlin State Higher Education Act (*Berliner Hochschulgesetz* - BerlHG) in the version of 26 July 2011 (Gazette of Laws and Ordinances p. 378), last amended by Article 6 of the Act of 2 February 2018 (Gazette of Laws and Ordinances p. 160), as well as in conjunction with Section 10 of the Act on the Admission to Higher Education Institutions in the State of Berlin to Degree Programs with Restricted Admission (*Berliner Hochschulzulassungsgesetz* - BerlHZG) in the version of 18 June 2005 (Gazette of Laws and Ordinances p. 393), last amended by Article 6 of the Act of 26 June 2013 (Gazette of Laws and Ordinances p. 198), adopted the following application and admission regulations for the international consecutive master's program in Civil Systems Engineering:**

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I. General regulations

Section 1 – Scope of application

These application and admission regulations – in conjunction with the Regulations Governing General Study and Examination Procedures (AllgStuPO) and the Statutes of Technische Universität Berlin Governing University Selection Procedures (*Auswahlsatzung* - AuswahlSa), as amended from time to time – govern the application, admission and selection modalities for the international consecutive master's program in Civil Systems Engineering. The provisions of the AllgStuPO and AuswahlSa shall take precedence over the provisions of these application and admission regulations, unless exceptions are expressly permitted therein.

Section 2 – Entry into force

These application and admission regulations enter into force on the day after their publication in the Official Gazette of Technische Universität Berlin (Official Gazette TU). They shall be applied for the first time to the procedures of the 2020/21 winter semester.

** Approved by the TU Berlin Executive Board on 03-02-2020 and Senate Chancellery Higher Education and Research on 11-06-2020

II. Application

Section 3 – Application requirements

(1) In addition to the general admission requirements set out in Sections 10 to 13 BerlHG, applicants must have:

1. A bachelor's or equivalent university degree in a degree program in civil engineering, architecture, or a related study program
2. Technical knowledge amounting to
 - At least 12 CP in constructive mechanics
 - At least 6 CP acquired in a design project for a structural engineering system
 - At least 6 CP in the area of computational design or computer science
3. English language proficiency at Level C1 of the Common European Framework of Reference for Languages or an equivalent standard

(2) As a rule, a degree program is deemed related when it consists of the following:

- At least 12 CP in constructive mechanics
- At least 6 CP acquired in a design project for a structural engineering system
- At least 6 CP in the area of computational design or computer science

Section 4 – Procedure

(1) The fulfillment of the admission requirements must be proven during the enrollment procedure in accordance with Sections 16ff. AllgStuPO, in cases outlined in Section 15 AllgStuPO as part of the application for admission. Supporting documents must be submitted in the original or as officially certified copies.

(2) The department in the Central University Administration responsible for enrollment and admissions decides on the subject relevance of programs within the meaning of Section 3 (1) no. 1 and Section 3 (2), as well as the equivalence of the credits required to fulfill the requirements specified in Section 3 (1) no. 2 and 3 on the basis of a vote by the examination board responsible for the study program.

III. Admission

Section 5 – Restriction of the number of eligible candidates

The number of eligible candidates for the selection process can be restricted. It must be at least double the designated number of admissions. The selection criterion for participation in the selection process is the applicants' qualification level. The selection committee decides on any restriction, the number of eligible candidates, and their selection at the beginning of the selection process.

Section 6 – Ranking criteria

(1) A ranking of applicants shall be prepared according to the following selection criteria:

1. Overall grade from the preceding program in accordance with Section 3 (1) no. 1 with a weighting of 55/100
2. Outcome of a selection interview to be conducted by the University in accordance with Section 7 (3) with a weighting of 45/100

(2) For the criterion according to Subsection 1, no. 1, up to 100 points shall be awarded according to the following table:

Grade	Points	Grade	Points
1.0	100	2.6	52
1.1	97	2.7	49
1.2	94	2.8	46
1.3	91	2.9	43
1.4	88	3.0	40
1.5	85	3.1	37
1.6	82	3.2	34
1.7	79	3.3	31
1.8	76	3.4	28
1.9	73	3.5	25
2.0	70	3.6	22
2.1	67	3.7	19
2.2	64	3.8	16
2.3	61	3.9	13
2.4	58	4.0	10
2.5	55		

(3) For the criterion outlined in Subsection 1, no. 2, up to 100 points shall be awarded in accordance with the following arrangement.

Section 7 - Procedure

(1) To this purpose, applications must include the following documents in the original or as officially certified copies:

1. The documents requested in the application form
2. Proof of meeting the additional admission requirements pursuant to Section 3
3. Insofar as the course content in accordance with Section 3 (1) no. 1 and 2 is not apparent from the degree certificate, evidence thereof, as a rule in the form of module descriptions and
4. A letter of motivation (roughly 1 DIN A4 page) as preparation for the selection interview and two letters of reference written in English by professors working in relevant disciplines and employed at a university. The letter of motivation and reference letters should contain clear information concerning the specific reasons for the choice of degree program and location, possible future professional goals, as well as the applicant's ability to successfully complete the international consecutive master's program.

(2) For each selection criterion, the selection committee shall award points in accordance with Section 6 (2) and (3).

(3) The selection interview is conducted in English by two members of the selection committee authorized to conduct exams in accordance with Section 6 (1) no. 2. At least one of the interviewers must be a professor at TU Berlin. To determine the applicant's aptitude, motivation, and reasons for pursuing the selected degree program and desired career, the selection interview shall address the following topics:

1. Motivation for studying, expectations of and information about the learning outcomes and curriculum in relation to the submitted letter of motivation and reference letters
2. The applicant's ideas and aims regarding their future professional career
3. The applicant's ability to solve complex problems in a team (tolerance for mistakes, conflict management, structured work, creativity)

The key content of the interview and a justification for the allocation of points are to be recorded in writing. Points are allocated as follows:

1. 50 points maximum for the applicant's motivation for studying
2. 25 points maximum for applicant's future professional goals
3. 25 points maximum for the applicant's ability to solve complex problems in a team (tolerance for mistakes, conflict management, structured work, creativity)

If the interviewers assign varying point values, these points are added together and the average is calculated. The final score is be rounded off to one decimal place.

(4) The selection committee shall rank the applicants in order of preference. This list documents the following for each participant in the selection process:

1. Number of points achieved for each criterion.
2. Weighted number of points for each criterion in accordance with Section 6 (1).
3. Total number of points.