Study and Examination Regulations

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.

	AMBl.
Study and Examination Regulations	15/2023
Application and Admission Regulations	08/2020

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I. Rechts- und Verwaltungsvorschriften

Fakultäten

Study and Examination Regulations for the international English-language consecutive master's program Civil Systems Engineering at Faculty VI – Planning Building Environment at Technische Universität Berlin

of 22 February 2023

On 22 February 2023, the Faculty Board of Faculty VI – Planning Building Environment 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 (BerlHG) in the version of 26 July 2011 (Gazette of Laws and Ordinances p. 378), last amended by Article 1 BerlHG of 5 July 2022 (Gazette of Laws and Ordinances, p. 450) adopted the following study and examination regulations for the Civil Systems Engineering international English-language consecutive master's program.*)

Contents

I. General regulations

Section 1 – Scope of application

These study and examination regulations govern both the objectives and structure of studies, and the requirements for and conducting of examinations in the consecutive master's program in Civil Systems Engineering. The program-specific provisions included herein supplement the General Study and Examination Regulations of Technische Universität Berlin (*Allgemeine Studien- und Prüfungsordnung der TU Berlin* - AllgStuPO).

Section 2 – Entry into force/Expiry

(1) These regulations enter into force on 1 October 2023 and apply to students enrolling beginning winter semester 2023/24.

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*) Approved by the TU Berlin Executive Board on 23.03.2023.

(2) In addition to the students mentioned in subsection 1, these study and examination regulations apply to all students already enrolled in the master's program in Civil Systems Engineering at Technische Universität Berlin.

(3) The Study and Examination Regulations for the consecutive master's program in Civil Systems Engineering of 16.10.2019 (Official Gazette TU 08/2020, p. 109) cease to be effective upon the entry into force of the present regulations.

II. Program objectives and structure

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

(1) Building on a bachelor's degree in civil engineering, architecture or an equivalent program, the master's 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 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 on 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 and with consideration for a large number of alternatives
- The ability to independently develop solutions and strategies for specific practical and 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 German employers

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 writing the master's thesis, is four semesters.

(3) The master's program equals 120 credits.

(4) Instruction and examinations in compulsory modules are conducted in English. The compulsory elective component includes modules to teach students the language skills they need 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 all examination procedures are structured and organized so that students can complete the program within the standard period of study.

Section 5 – Program structure

(1) Students are entitled to plan their own individual curriculum. They are, however, obliged to comply with the provisions laid out in 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.

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

(3) The compulsory component, including the master's thesis, is worth 54 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 42 credit points and is structured as follows: Development of basic engineering skills worth at least 24 credit points and language skills worth a maximum of 18 credit points. The modules assigned to each component can be found in the module list (Annex 1).

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

(6) The skills taught in each module, module examination requirements, and admission requirements, if any, are updated annually in the form of program-specific module catalogs in accordance with Section 45 (4) of the General Study and Examination Regulations (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 conducting 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

Technische Universität Berlin awards the academic degree "Master of Science" (M.Sc.) on behalf of Faculty VI 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 in accordance with Section 9.

(2) The overall grade is determined in accordance with the principles outlined in Section 68 (7) of the General Study and Examination Regulations (*Allgemeine Studien- und Prüfungsordnung* - AllgStuPO). It is based on module grades, including the master's thesis, amounting to

90 credit points; ungraded modules and modules with the lowest grades amounting to a maximum of 25 % of the overall performance (maximum of 30 credit points) 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 worth the same number of credit points, the most recently completed module exam is not counted. To achieve the designated number of credit points, only complete modules are counted, i.e. the total number of credit points disregarded may be below the allowed number, if including the next module would mean exceeding the permitted total number of credit points to be disregarded. 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 equals 30 credits.

(2) The writing period is 20 weeks. If there are significant reasons beyond the student's control preventing them from completing the thesis within this time frame, the examination board shall grant an extension of the deadline for as long as the reasons in question continue to exist. The total possible extension may not exceed 20 weeks. In the event that combined extensions exceed the stipulated maximum period of extension, the student may withdraw from the examination.

(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. The examination board is responsible for the recognition of language skills. A confirmation of language level from the examination board is to be submitted along with the application for admission to the master's thesis.

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

(5) The procedures for applying for admission to as well as assessment of the master's thesis are regulated in the current version of the General Study and Examination Regulations (AllgStuPO).

(6) At least one assessor must be a university professor at TU Berlin. Persons with experience of professional work and training can be appointed as examiners of final theses. This generally applies to second examiners. The minimum requirement is that they have at least the degree pursued by the program or an equivalent degree.

Section 10 – Types of examination and registration for examinations

(1) The General Study and Examination Regulations (AllgStuPO) as last amended govern the different types of examination and the procedure for registering for module examinations.

(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 list[1]

	CP	Type of examination	Graded	Weighting[2]
Compulsory modules				
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 24 CP)				
Geometry models in civil engineering informatics	6	Portfolio assessment	Yes	1.0
Agile systems engineering	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 - Geotechnology	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)[3]				
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
Elective modules (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.	24	Dependent on the module selected		1.0

[1] The module catalog and 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 General Study and Examination Regulations (AllgStuPO)).

[2] A “1” means that the grade will be weighted according to the number of credits (Section 47 (6) AllgStuPO); “0” means the grade is not weighted; every further figure is a multiplication factor of the number of credits. For further details, see Section 8 (2) of these regulations.

[3] The modules for obtaining German language skills are only intended to teach students without a German university entrance qualification certificate or German-language first university degree the language skills needed for the German job market.

Annex 2 - Proposed course schedule

<table>
<tr><th>1st semester</th><th>2nd semester</th><th>3rd semester</th><th>4th semester</th></tr>
<tr><td colspan="4">Compulsory modules totaling 54 CP</td></tr>
<tr><td>Modeling civil engineered systems
6 CP</td><td></td><td>Project – Civil systems engineering
6 CP</td><td rowspan="6">Master’s thesis
30 CP</td></tr>
<tr><td>Multi-physics approaches for modeling civil systems
6 CP</td><td></td><td></td></tr>
<tr><td>Whole life civil systems analysis
6 CP</td><td></td><td></td></tr>
<tr><td colspan="3">Compulsory elective courses totaling 42 CP</td></tr>
<tr><td colspan="3">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.</td></tr>
<tr><td colspan="3">Elective courses totaling 24 CP</td></tr>
<tr><td colspan="3">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 universities and higher education institutions abroad recognized as equivalent.</td></tr>
</table>

In principle, a stay abroad is possible at any time. However, the third semester is recommended for this purpose. 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:**

Overview of content

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.

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

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

(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.