

Széchenyi István University  
Faculty of Architecture, Civil Engineering and Transport Sciences  
Department of Transport Infrastructure and  
Water Resources Engineering  
Department of Structural and Geotechnical Engineering

**Diploma thesis preparation guide and  
Final Examination Regulations  
For students of MSc in Infrastructure Civil Engineering**

Supplement for the Faculty of Architecture, Civil Engineering and Transport  
Sciences Final Examination Regulations

Adopted by the Faculty Council on 16 November 2022  
Valid for students starting their studies from the autumn semester of the  
academic year 2023/24

## **Introduction**

The purpose of this guide is to describe the thesis writing process for Master of Civil Engineering students and to help them through the steps to ensure the quality of their thesis.

The thesis may solve an infrastructure engineering problem or research a topic in a specific field. Based on the student's academic knowledge, it should require one semester. However, additional study is often required, as well as guidance from a consultant. By completing the thesis, the candidate demonstrates sufficient competence in the practical application of acquired knowledge, carries out the design and analytical tasks of an engineer, synthesizes literature beyond the course material, and understands the economics and social dimensions of their project.

The process of writing your thesis is organized according to the following points:

- 1) Choice of topic and internal consultant, submission of data sheet
- 2) Thesis writing
- 3) Interim report
- 4) Thesis submission
- 5) Evaluation
- 6) Final examination

### **1) Choice of topic and internal consultant**

The student should choose a research area and contact a known lecturer and/or supervisor in this area. The student may choose his/her own topic or ask the internal consultant for a topic proposal. Each department may post suggested topics and publish the titles of previous years' topics as examples.

A Thesis Approval Form must be completed and submitted to the appropriate department (Department of Transportation and Water Resources Engineering or Department of Structural and Geotechnical Engineering). Deadline for submission: 15 June or 15 January (or the first working day thereafter) of the semester prior to the semester in which the thesis is due.

The thesis topic will be approved by the thesis committee on the basis of the content of the application form and the student will be notified by 30 June or 31 January (or the first working day thereafter). The committee may request clarification, change the content or reject the thesis topic. Once approved, the internal consultant will prepare the Assignment Description by the third week of the academic term.

With regard to the choice of topic, it should be borne in mind that the MSc thesis is more complex in content and methodology than the BSc thesis. The Master's student is expected to be familiar with, present and possibly apply certain international results.

Examples of master's level thesis criteria include:

- complex;
- novel,
- international experience;
- innovative, and international in scope,
- professional software-supported modelling,
- optimization or parametric exercises.

The following provides guidance on the choice of topics by specialization through examples.

### **Transportation Infrastructure Engineering specialization**

<b>Topics to avoid</b>	<b>Better suggestions</b>
<b>X</b> Presentation of the road study plan	✓ Multi-criteria analysis and complex analysis of road study variants using economic-mathematical analysis methods
<b>X</b> Preparing the design documentation for the authorization of the junction	✓ Solving (potentially novel) node type problems based on proposals using complex analysis methods
<b>X</b> Identifying and solving transport problems in the municipality	✓ Developing, modelling and evaluating complex solutions to the transport problems of the municipality according to performance indicators
<b>X</b> Presentation of road-railway construction technology	✓ Analysis of domestic and foreign road and railway construction technology methodologies, analysis of technology measurements (laboratory, on-site) using statistical methods

### **Geotechnical Engineering specialization**

<b>Topics to avoid</b>	<b>Better suggestions</b>
<b>X</b> Presentation of a study design for a geotechnical structure	✓ Multi-objective analysis and complex analysis of structural study designs using geotechnical software
<b>X</b> Preparation of permit design documentation for an existing or planned geotechnical structure	✓ Solving (potentially novel) geotechnical structure problems based on complex analytical methods
<b>X</b> Technology demonstration	✓ Analysis of domestic and foreign technology methodologies, analysis of technological measurements (laboratory, on-site) using statistical methods
	✓ In the field of geotechnics, processing and summarizing own research results
<b>X</b> The evolution of construction costs and risks in the case of geotechnical structures	✓ Analysis of the use and impact of the extent of excavation and/or monitoring systems on construction costs and risks

### Water Resources Engineering specialization

Topics to avoid	Better suggestions
X Sizing of municipal water/sewer utilities	✓ Sizing of municipal water/sewer utilities using software, problem identification, development and evaluation of proposed solutions, application of blue green infrastructure elements
X Presenting new technical methods and technologies in hydraulic engineering	✓ Evaluating, and recommending new design methodologies used in water resources engineering by analytical and numerical methods
X Simple hydraulic study of the riverbed	✓ Use hydrologic or hydraulic numerical models to calibrate, verify, and analyze rainfall-runoff, channel flow.
X Sizing of water management facilities, assessment of operational design	✓ Developing a water management concept plan or modelling river basin systems using numerical or statistical techniques.

#### 2) Thesis writing

The formal requirements for the thesis must be downloaded from the department's website. Regular consultation is mandatory with both the university (min. 5 times) and outside advisers.

#### 3) Interim report

An interim report provides a short-term quality check to assist the student in his/her work. Approximately 1.5 months before the thesis submission deadline (November in the autumn semester and April in the spring semester), students give an interim report on the content and progress of their thesis in a 10-minute PowerPoint presentation. The report is compulsory and a prerequisite for the submission of the thesis, for which the two departments set up committees according to the specialization (geotechnical engineering, transport engineering, water resources engineering).

#### 4) Thesis submission

One hardback copy of the thesis must be submitted to the relevant department.

Deadline: 15 May or 15 December (or the first working day following)

The electronic version must be uploaded on the University Library website (<https://lib.sze.hu/kezdolap>). Uploading instructions are also available on the website.

Deadline: available on the library website.

#### 5) Evaluation

The thesis will be assessed by an external reviewer using an evaluation matrix and written questions. Prior to the final examination, the student will receive the assessment in advance and will study it.

## 6) Final exam

The final examination includes a thesis defense and a comprehensive examination.

### 1) Thesis defense

- A 15-minute oral presentation is required to prepare for the thesis defense.
- Answering the questions asked in the assessment. Supplementary questions from the Final Examination Committee related to the thesis.

### 2) Comprehensive exam

- In the comprehensive final examination, the Final Examination Committee will verify the student's professional knowledge on the basis of the student's oral answers.
- The Final Examination Committee will ask additional questions related to the topic of the thesis or to broader professional aspects in a comprehensive examination. The topics will be assigned to the student in advance by the university adviser in conjunction with the specialization supervisor.
- At the beginning of the comprehensive final examination, the student draws two topics at random from the five previously allocated.
- The student has a minimum of 20 minutes to prepare. The preparation time may be shortened at the student's request but may not be extended.
- The student will present his answers to each topic separately. When the topics are presented, the members of the Final Examination Committee may ask the candidate questions.

### Diploma qualification:

- mark for the thesis defense\* with a weighting of 40%,
- the mark for the complex examination with a weighting of 20 %, and
- the average of the academic results with a weighting of 40 %.

\* The mark for the thesis defense is not the mark for the thesis course! The mark for the thesis course reflects the student's competence and progress in the preparation of the thesis and counts towards the academic results with 20 credits.

Győr, 14 November, 2022

Infrastructure Civil Engineering MSc Programme Committee