Guidelines for the Preparation of the Master's thesis in the Computational Science and Engineering (CSE) programme

1. General

- The provisions of the subject-specific study and examination regulations for the Computational Science and Engineering programme apply: FSPO CSE 2019 in particular § 16 - § 18 and FSPO CSE 2025 in particular § 8. Unless otherwise stated, the information applies to both versions.
- The Examination Board decides on matters relating to the approval and acceptance of the thesis.
- The Master's thesis is the final component of the Master's programme.
- The duration for completing the Master's thesis is six months.
- The Master's thesis may also be completed as a group project; see below.
- The Master's thesis is supervised by two examiners. The examiners are the assessors. *If you are studying under the FSPO CSE 2019*: The Master's thesis is supervised by one examiner from Ulm University and one examiner from Ulm University of Applied Sciences.
  If you are studying under the FSPO CSE 2025: The two examiners may be from either the University of Ulm, Ulm University of Applied Sciences, or one from each of the two institutions.
- The Master's thesis may also be completed outside an institute participating in the Computational Science and Engineering Master's programme or within a company (external Master's thesis).

2. Aim of the Master's thesis

The Master's thesis serves to demonstrate that students are capable of addressing a complex scientific problem in the field of Computational Science and Engineering independently and using sound methodological principles. It combines mathematical modelling, numerical simulation and algorithmic methods with applications in engineering or the natural sciences, and requires the integration of interdisciplinary approaches. The thesis should contribute to research or application and demonstrate the ability to undertake structured project planning and problem-solving, as well as to present scientific results clearly in both written and oral form.

3. Choice of topic

- The topic of the Master's thesis must have a clear connection to CSE (e.g. the thesis should utilise key CSE methods such as mathematical modelling, numerical simulation, algorithmic procedures or data-intensive analyses, and should be linked to an application in engineering, the natural sciences or economics).

- The topics (assignments) for Master's thesis are usually set by examiners from the Ulm University or Ulm University of Applied Sciences; in such cases, these examiners also act as the first assessor and supervisor of the Master's thesis.

4. External Master's thesis

- The document „*Guidance for students on external final thesis*" summarises key information.
- A Master's thesis completed within a company is referred to as an external Master's thesis
- An external Master's thesis must be approved by the chair of the CSE Examination Board. Registration must be completed using the form: „*Application for Approval of an External Master's thesis*".
- The following documents must be attached to the application for approval of an external Master's thesis:
  - Outline of the planned project (task, schedule, milestones)
  - List of the main methods used
  - Statement regarding appropriate supervision and the necessary infrastructure, including software licences, at the external institution (Tip: How is the Master's thesis structured within the company? Who is supervising the thesis? To which organisational unit is the supervisor assigned? Is hardware and software available at the company; if so, which?)
- It is possible that a confidentiality agreement and/or a restricted access agreement may be concluded with the company. An „*Information Letter to Companies*" has been drawn up for students, which they can use to provide company representatives with information regarding the confidentiality agreement.
- For confidentiality agreements and/or non-disclosure agreements, **only the forms jointly developed** by the Ulm University and Ulm University of Applied Sciences will be accepted.

5. Registration for the Master's thesis

- Students who have completed modules totalling 60 ECTS credits may register for the Master's thesis (the provisions of FSPO CSE 2025 § 8 (4) and FSPO CSE 2019 § 16 (2) apply).
- Registration must be submitted via the Studiensekretariat at Ulm University using the form. „*Antrag auf Zulassung zur Masterarbeit*" (in German only) (*https://www.uni-ulm.de/studium/pruefungsverwaltung/formulare-leitfaeden-studierende/*).
- The following **must always** be enclosed with the application form:
  - Outline of the planned project
  - List of the main methods used
- For all external Master's thesis, the „*Antrag auf Zulassung zur Masterarbeit*" (in German only) (*https://www.uni-ulm.de/studium/pruefungsverwaltung/formulare-leitfaeden-*

studierende/), signed by the CSE Examination Board, must be sent to the Studiensekretariat together with the „*Application for Admission to the Master's thesis*"

6. Formal requirements for the Master's thesis

- The Master's thesis is usually written in German or English. The language used must be agreed with the supervisor.
- Other languages are permitted with the consent of the supervisor and the subject examination board (FSPO CSE 2025 § 8 (7) or FSPO CSE 2019 § 17 (6)).
- The length, layout and formatting must be agreed with the supervisor.
- Obligatory components of the Master's thesis:
  - Cover page with title, name, student ID number, degree programme, supervisor, date
  - Declaration of Autonomy for written assignments, especially theses (https://www.uni-ulm.de/en/study/exam-administration/forms-and-guides-for-students/)
- In the case of group work, the individual's contribution to be assessed must be clearly delineated. The specification of sections, page numbers or other objective criteria that enable clear delineation must be clearly marked.

7. Submission of the Master's thesis

- The Master's thesis must be submitted digitally to the Studiensekretariat by the end of the submission period at the latest.
- Once the Master's thesis has been registered with the Studiensekretariat, the end of the submission period can be found on the Higher Education Services Portal.
- Submitting the Master's thesis to the examiner is not sufficient. (*https://www.uni-ulm.de/en/study/exam-administration/exams-and-modules-faq/*)
- It is possible to apply to the Chair of the Examination Board for a reasonable extension of the Master's thesis deadline, provided there is a valid reason. (ASPO 2025 § 18, or FSPO for CSE 2019 § 17 (4))

8. Assessment of the Master's thesis

- The Master's thesis consists of work on the assigned topic and a colloquium.
- A date for the colloquium must be agreed with the supervisor(s). You must register for the 'Masterkolloquium' via the examination portal.
- A Master's thesis is assessed by two examiners.
- The Master's thesis (29 ECTS) and the colloquium (1 ECTS) are assessed separately with their own grades.

- In the case of group work, the contribution of each individual to be assessed as an examination performance is evaluated on the basis of specified sections, page numbers or other objective criteria that allow for a clear demarcation.