Guidelines for the Research Internship II in the Chemical Engineering M.Sc. degree program

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The aim of the Research Internship II is to deepen knowledge, practical experience and insights into scientific workflows in preparation for starting a scientific (research and development) career.

The research internship should be used in particular to:

- work independently on a complex chemical engineering problem within a limited time frame using scientific methods.
- examine scientific objectives and hypotheses in light of current research.
- propose and/or evaluate a scientific methodology with respect to the topic.
- identify, plan and perform the required experimental and/or theoretical studies.
- evaluate and discuss the experimental results scientifically in written form and create underlining depictions and figures.

Academic supervision: Supervisor (PhD candidate, Post-Doc, Professor)

Academic examination: Examiner from the Institute of Chemical Engineering

Procedure for the research internship: Overview

1. **Duration:** 150 hours
2. **Hosts:** The internship can be conducted either in an external scientific institute or internally at the Institute of Chemical Engineering.
3. **Approval procedure:**
a) Institute of Chemical Engineering (internal): Competitive application for proposed research topics.
b) Other scientific research institutes (external): Application according to the hosts regulations. Approval by an examiner from the Institute of Chemical Engineering before internship start.
4. **Recognition:** Students write an internship report, receive an internship certificate from the host institute and submit the report to the assigned examiner. The examiner evaluates the report and approves pass or fail accordingly.

1. Duration

Research internships are usually carried out part-time and parallel to other courses.

M.Sc.: 5 ECTS*. This corresponds to 150 hours, i.e. usually 3 months part-time 30% (12 hours per week) or about 1 month in full time (40 hours per week).

*See the respective valid subject-specific study and examination regulations for the Bachelor's degree program in Chemical Engineering and the Master's degree program in Chemical Engineering at the Faculty of Natural Sciences at the University of Ulm.

2. Hosts for the scientific activity and types of activity

Hosts: The hosts are scientific research institutes with research activities.

Type: Ideally, Research Internship II is conducted based on a hypothesis prepared by the supervisor that the student must elucidate regarding a specific research question.

Typical areas of activity are:

- Critical Literature Review
- Conception/Improvement of a method (theoretical/practical)
- Experimental exploration of hypothetic effects
- Experimental validation of theoretically deduced effects
- Modelling and model evaluation
- Parametrization and validation of a model
- Simulation experiments for preparation of lab experiments
- Simulation experiments for quantification of effects
- Optimization of process steps (experimental/simulation)

The research internship is strictly focused on deepening scientific experience and expertise, which consequently requires to apply state-of-the-art scientific workflows and methods.

3. Approval procedure before the start of the internship

For internal research internships, approval is granted through positive feedback on an application. Students receive a working plan that is agreed upon with their respective examiner.

The application for approval of an external internship must be submitted to an examiner before the start of the internship. It must contain the following information

- Name of the research institute
- Name of the supervisor in the research institute
- Topic overview (short overview of max. 200 words) together with a work plan
- If applicable, Letter of Acceptance from the host institute

The examiner decides on approval of the proposed topic based on the provided information.

4. Recognition after the end of the internship

For recognition of the internship, the following documents must be submitted to the examiner:

- The internship report following the requirements for state-of-the-art scientific reporting, not exceeding 10 pages.
- The certificate of participation in case of an external research institution.

The examiner evaluates the documents and approves pass or fail accordingly.