Guideline for Writing Master's Thesis

Professorship of Computer Engineering
Department of Computer Science
TU Chemnitz

Prof. Dr. Dr. h. c. Wolfram Hardt

Chemnitz, Apr. 2025

version 2.2

Table of Content

Preface

With their Master's Thesis, students demonstrate their ability to conduct independent, scientifically sound research relevant to their field of study. Successfully completing the thesis requires applying acquired knowledge, scientific reasoning, and technical expertise to address the given topic. When applicable, the thesis may also contribute to ongoing development and research projects. However, it is essential to remember that the final thesis is a scientific paper.

To ensure a structured and successful thesis process, important rules and guidelines must be followed. This guide provides instructions for completing your Master's Thesis and outlines the general procedures at the Department of Computer Engineering, Faculty of Computer Science, TU Chemnitz.

As you progress through your thesis, you will encounter new challenges and questions. You will need to make decisions regarding methods, implementation, and formulation, and at times, you may feel uncertain about how to proceed. This is a natural part of a research project of this scale and a valuable learning experience at the culmination of your studies.

I am confident in your ability to succeed, as I have entrusted you with this subject.

Good Luck!

Prof. Dr. Dr. h. c. Wolfram Hardt

Head of Professorship of Computer Engineering
Department of Computer Science
TU Chemnitz

1. Overview of the Master's Thesis

1.1. General Requirements and Goals

At the end of the Master's degree program, students must prove their ability to produce a scientifically sound, independent piece of research that applies the knowledge gained during your studies to a real-world or theoretical problem by completing a Master's Thesis.

Master's Thesis is a comprehensive research project which takes **6 months** that includes implementation and scientific documentation. It presents an in-depth study of a specific topic, incorporating theoretical analysis, practical application, and structured reporting. Your Master's Thesis should:

- **Follow Academic Standards:** The thesis must be a scientific paper, adhering to proper academic standards, including structured writing and correct referencing.
- **Contribute to Research or Development:** When applicable, the thesis should support ongoing development or research projects.
- **Employ Systematic Inquiry:** The work should involve a methodical approach, critical analysis, and logical problem-solving.
- **Demonstrate Expertise:** Showcase both technical mastery and the ability to think in a structured, scientific manner.
- **Show Topic Understanding:** Reflect a deep understanding of the chosen topic and its relevance in both academic and practical contexts.
- **Integrate Knowledge and Skills:** Combine theoretical knowledge with practical skills to propose, implement, and evaluate a solution to a defined research problem.
- **Maintain Scientific Accuracy:** Ensure the work meets scientific expectations, including precision, logical argumentation, and detailed analysis.
- **Advance the Field:** Provide value by addressing knowledge gaps, offering new insights, or developing innovative solutions to relevant problems.

This document outlines the core processes and mandatory steps required by the professorship of Computer Engineering at TU Chemnitz, ensuring that your thesis adheres to the university's standards.

1.2. Thesis Milestones and Timeline

The Master's Thesis at the Professorship of Computer Engineering follows a structured process with key milestones, each representing a distinct phase:

1. Topic Selection and Approval
2. Conceptualization and Thesis Planning
3. Official Registration
4. Implementation & Writing
5. Report Submission
6. Defense

Each milestone demands specific **deliverables** within a defined **deadline** (see Section 3.2). The Section 2 elaborates on these phases, specifying expectations, requirements, and best practices for completing the thesis effectively. Students must collaborate with their supervisor to define and adapt a thesis plan tailored to their topic.

Fig. 1 provides a visual overview of the thesis timeline, outlining major milestones and deliverables within their recommended timeframes. This structured approach ensures students adhere to deadlines and maintain steady progress.

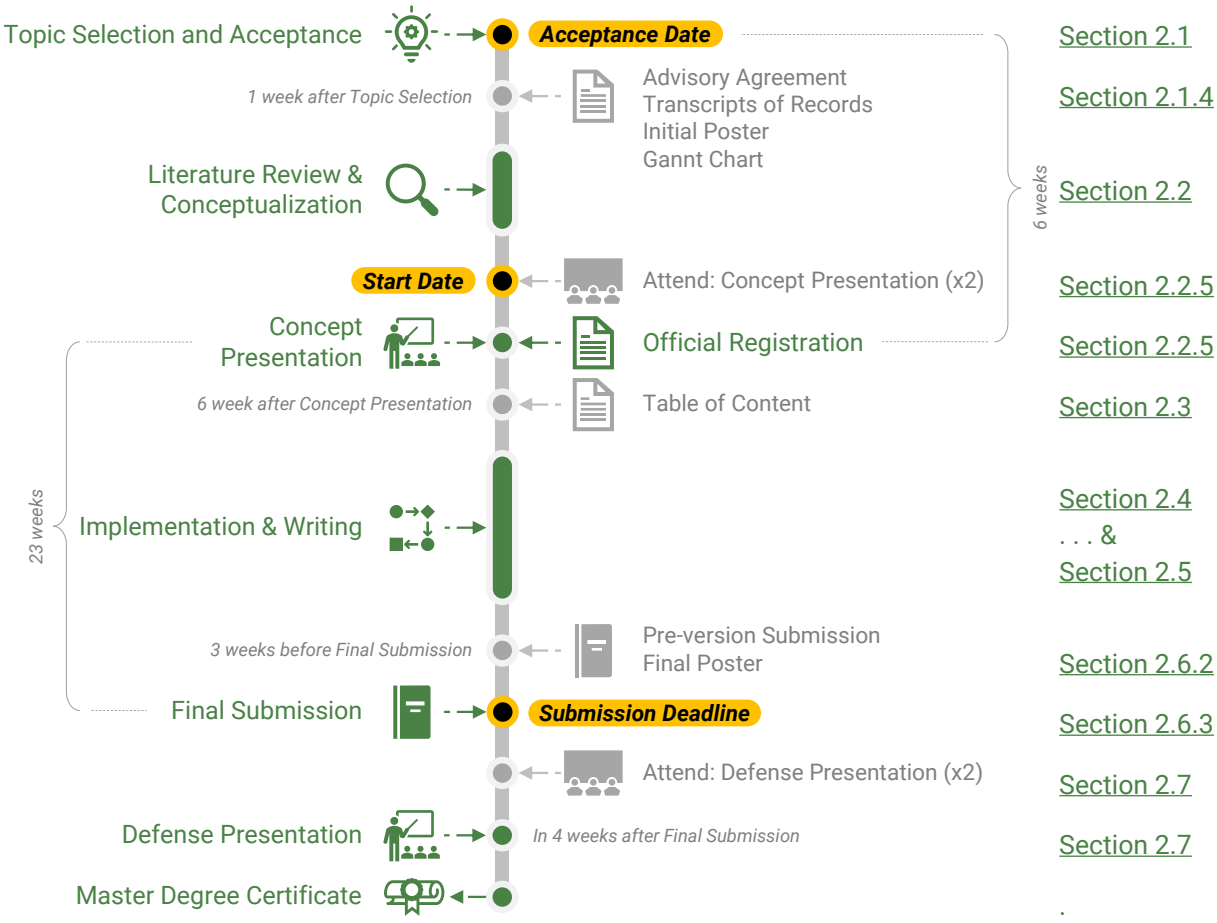

Fig. 1. Master's Thesis Timeline

2. Thesis Process

This chapter provides a step-by-step guide to completing a Master's Thesis, covering all phases from topic confirmation to the final defense. Each section corresponds to a key milestone, detailing requirements, deliverables, and expectations. By following this structured approach and maintaining regular communication with the supervisor, students can effectively manage their progress, meet deadlines, and ensure compliance with academic standards.

2.1. Topic Selection and Approval

A well-defined thesis topic is essential for a successful Master's Thesis. It must address a **scientific challenge** rather than focus solely on implementation. The topic must be approved by the **Professorship of Computer Engineering** before thesis work can begin.

There are **two types of Master's Theses**:

- **Internal Thesis:** The topic is provided by the Professorship of Computer Engineering.
- **External Thesis:** The topic is defined by the student, in cooperation with an external supervisor from a company.

2.1.1. Topic Description

The 📋**topic description** is a formal definition of the Master's Thesis task, outlining the research problem, objectives, and scope. It must be at least half a page (DIN A4) and comprehensively address all required aspects. As the foundation of the thesis, it must be:

- **Scientifically relevant:** Focused on research, not just technical implementation.
- **Clearly structured:** Containing essential academic components.
- **Feasible:** Achievable within the ⏰ **23-week** timeframe.

A valid topic description must include:

- **Classification of the topic:** Defines the field of research.
- **State of the Art** (Initial Situation): Summarizes existing research and current challenges.
- **Research Question** (Scientific Challenge): Clearly states the problem the thesis addresses.
- **Goal:** Defines the thesis objectives and expected contributions in a **concrete** and **measurable** manner.

Key Considerations When Defining a Topic

1. **Defining the Research Question & Objective**
   - **Motivation:** How the question or objective addresses a real problem, contributes to ongoing research, or fills a gap in current technology or knowledge?
   - **Relevance:** Why the topic is worth investigating and who could benefit from the findings (e.g., industry, academia, specific user groups)?
   - **Objective:** A concise statement of the central goal or challenge that the thesis aims to address, often phrased as a direct aim or hypothesis.
   - **Expected Outcomes or Hypotheses:** What the thesis aims to test, prove, or demonstrate?
2. **Defining the Scope:**
   - What research areas or technologies will be covered?
   - Which methods, frameworks, or tools will be used?

- How complex or advanced should the final solution be? (e.g., a basic prototype vs. a fully developed system).
- Major scope changes must be discussed with the supervisor.

3. **Identifying Expected Deliverables:**
   - **Software Prototype:** Code, documentation, and implementation examples.
   - **Hardware Design or System Integration:** Circuit diagrams, test results, user manuals.
   - **Formal Proof or Theoretical Model:** Mathematical proofs, logical arguments, or simulations.
   - **Evaluation Results:** Performance tests, data analysis, benchmarks.

A well-defined topic ensures the research remains scientifically relevant, with a clear research question, scope, and deliverables. Properly structuring these elements helps maintain focus, streamline planning, and align with academic standards.

2.1.2. Internal Thesis

An **internal thesis** means the topic is provided by the Professorship of Computer Engineering. The student chooses an available topic and works under the guidance of a university supervisor.

Process for Internal Thesis:

1. Register at the OPAL course for Internal Master's Theses. Each semester there will be a dedicated course.
   - https://bildungsportal.sachsen.de/opal/auth/RepositoryEntry/4513644544O?3
2. Upload following documents into OPAL course:
   - Current 📋**Transcript of Records** (PDF from SB Service)
3. **Select a topic** from the available options provided by the professorship.
4. Discuss and finalize the topic with the university supervisor.

2.1.3. External Thesis

An **external thesis** means the topic is defined by the student and the external supervisor from a company but must be approved and overseen by a university supervisor. The topic selection and registration process for an external Master's Thesis must be completed at least ⏰ **1 month** before the planned *start date*.

Process for External Thesis:

1. Register at the OPAL course for External Master's Theses. Each semester there will be a dedicated course.
2. Download the registration document and fill it out completely. This form includes the **topic description**.
   - https://bildungsportal.sachsen.de/opal/FolderResource/10056597504/Registration/Vorlage_Extern_Englisch.docx
3. Rename the file using the following format:
   - Registration_firstname_lastname.doc (e.g., Registration_Max_Mustermann.doc)
4. Upload following documents into **External Master's Theses Folder**:
   - Filled 📋**Registration Form**
   - Current 📋**Transcript of Records** (PDF from SB Service)

5. After that, the topic will reviewed, and if appoved, an university supervisor will be assigned.

2.1.4. Topic Approval

Regardless of the topic source, establishing a clear understanding of the requirements facilitates effective planning. It remains the student's responsibility to clarify:

- The main research question or objective.
- The precise scope of the work.
- The expected outcome/deliverables

Students can only start work on the thesis after receiving **official topic approval**. The student must sign an 📋**Advisory Agreement** immediately after topic approval and submit it to ce-teaching@informatik.tu-chemnitz.de. The date of signing will be counted as the ***Acceptance Date*** of the thesis.

- https://www.tu-chemnitz.de/informatik/ce/lectures/master.php.en#information

2.1.5. Additional Considerations

Regardless of the topic source, following aspects must be addressed:

- **Feasibility Check:** Before fully committing to the project scope, it can be helpful to confirm that the necessary resources (hardware, software, data access) are available and that the proposed workload is realistic within the allotted time. Discuss any concerns with the supervisor early to avoid delays later.
- **Non-Disclosure Agreements (NDAs):** In cases where the thesis topic involves industry collaboration or confidential data, an 📋**NDA** may be required. Ensure that any confidentiality constraints can still satisfy the department's requirements for public defense and archiving of the thesis. Clarify the NDA scope with the external supervisor before starting any detailed work.
  - A maximum NDA duration of **3 years** is accepted by the Professorship of Computer Engineering.
- **Acceptable Negative Conclusions:** Not every research question will lead to a successful or positive result. A scientifically valid explanation of why a particular approach failed—or under which conditions it might fail—is still acceptable if it is well-documented and analyzed. Discuss this possibility with the supervisor if the risk of inconclusive results arises.

Hint

By clarifying the scope, setting a clear research question or objective, identifying expected deliverables, and reviewing the additional considerations (feasibility checks, NDAs, references, and a rough timeline), a solid foundation is established for proceeding to the next steps in the thesis process. Once these points are addressed and approved, the thesis work can advance to more detailed planning and subsequent milestones.

2.2. Conceptualization and Thesis Planning

This is an initial and crucial phase in the thesis process. It involves reviewing existing knowledge (state of the art), studying any necessary theoretical foundations, defining a clear method, and creating a feasible timeline with milestones. Completing this phase is essential for the official acceptance and registration of the thesis at the Examination Office (ZPA).

2.2.1. Initial Poster

After the Master's Thesis is approved, the student must prepare and submit an **Initial Poster** within **1 week** to ce-teaching@informatik.tu-chemnitz.de.

The purpose of the initial poster:

- Provides a public overview of your thesis.
- Helps structure the motivation and objective of your research.
- Serves as a clear summary of your topic and task.

The motivation and objective must be written in the student's own words using the official template provided on the Professorship's website:

- https://www.tu-chemnitz.de/informatik/ce/lectures/master.php.en#templates

To prepare the final version of the poster, students must use the **Poster Generator** (https://printgenerator.tu-chemnitz.de), as it ensures compliance with the corporate design of TU Chemnitz. The generator only works within the campus network or via VPN.

2.2.2. Literature Review and Theoretical Background

A solid understanding of current research and any required theoretical foundations helps identify what already exists, what is missing, and what must be learned to complete the thesis.

1. **Literature Review** (State of the Art)
   - **Purpose:** Identify and review research, publications, and technical solutions directly related to the thesis topic.
   - **Where to Search:** Library catalogues (e.g., books, reference materials, theses, reports), online databases (e.g., IEEE Xplore, Springer, Scopus, Google Scholar), scientific journals, conference proceedings, and reputable websites.
   - **How to Research:**
     - **Skim and Scan:** Review abstracts, introductions, and conclusions to identify relevant sources.
     - **In-depth Reading:** Focus on the methods, results, and limitations of relevant work.
     - **Organize Notes:** Summarize key findings, methods, and unresolved challenges.
   - **What to do:**
     - **Define Keywords:** Start with a list of relevant keywords and phrases related to the thesis topic.
     - **Create a Reference List:** Keep track of all sources using reference management tools (e.g., Mendeley, Zotero, EndNote).
     - **Summarize Findings:** Write brief summaries of each source, noting how it relates to the research question.

- **Identify Gaps:** Highlight areas where current research is incomplete or where the thesis can contribute.
- **Structure the Survey:** Organize the findings logically (e.g., by theme, chronology, or methodology).

2. **Theoretical Background** (Fundamentals)
   - **Purpose:** Study foundational concepts, theories, or principles that may not have been covered in the Master's program but are essential for understanding or solving the thesis problem.
   - **Key Actions:**
     - **Study Core Concepts:** Learn the required theories, models, or tools through textbooks, tutorials, or online courses.
     - **Document Key Points:** Summarize the essential theoretical background in the "Fundamentals" or "Background" section of the thesis.
     - **Link to the Thesis:** Clearly explain how the theoretical knowledge will support the proposed solution or methodology.

Literature review summarizes existing research, highlighting established knowledge and identifying gaps where the thesis makes a contribution. Additionally, a clear understanding of relevant theoretical foundations is required to ensure readiness for addressing the thesis problem effectively.

Hint

At this stage, students must conduct a background survey to build a strong foundation for their thesis. While there is **no immediate submission requirement**, it is highly recommended to **seek feedback from the supervisor** to ensure the research is on the right track. The findings from this review will be crucial later when structuring the thesis, defining the methodology, and positioning the research among existing work.

2.2.3. Concept, Implementation, and Evaluation

Once the literature survey is complete, the next step is to define the thesis concept, describe the implementation plan, and outline the criteria for evaluating results.

1. **Concept**
   - **Purpose:** Establish the approach or methodology for solving the research problem.
   - **Key Points:**
     - **Justification:** Explain why this method is appropriate, based on findings from the literature survey.
     - **Improvement:** Highlight how the method builds on or improves existing solutions.
     - **Formal Description:** Provide a structured description of the approach (e.g., models, algorithms, or frameworks).
2. **Implementation Plan**
   - **Purpose:** Detail how the proposed method will be developed and realized.
   - **Key Points:**
     - **Development Environment:** Identify tools, platforms, datasets, or technologies to be used (e.g., programming languages, simulation tools, hardware).
     - **Implementation Steps:** Break down the process into specific tasks, such as defining a detailed system architecture or design (if not done in the concept phase), coding, testing, and documentation. Create a roadmap if applicable.
     - **Practical Considerations:** Address logistical factors, including hardware setup, software dependencies, or collaboration with external teams or advisors.
3. **Expected Results and Evaluation**
   - **Purpose:** Define what the thesis aims to achieve and how success will be measured.
   - **Key Points:**
     - **Expected Results:** Describe deliverables such as prototypes, proof-of-concept systems, analyses, or theoretical models.
     - **Testing and Evaluation Criteria:** Specify the metrics or benchmarks that will be used to assess results (e.g., accuracy, performance, resource efficiency).
     - **Validation Methods:** Outline how results will be validated, such as through comparisons with existing systems, testing on datasets, or running simulations.

By completing this step, students will establish:

- A clear methodology for approaching the problem.
- A feasible implementation plan describing how the solution will be realized.
- Well-defined results and evaluation criteria, providing a structured way to measure success.

Hint

Regular **discussions with the supervisor** are essential during this step to ensure that the methodology, implementation plan, and evaluation criteria are well-structured and feasible. Key decisions and outcomes should be reviewed and **approved by the supervisor** to keep the thesis on track and aligned with academic expectations.

2.2.4. Thesis Plan

After defining the concept and expected outcomes, the next step is to prepare a **project plan** outlining the phases of the thesis, with clearly defined content and goals for each phase. Each phase must conclude with a milestone that marks significant progress. The project plan should be discussed and finalized with the supervisor before moving forward.

Students must **allocate time** for each phase, considering potential risks and dependencies, such as material availability or connections to external projects beyond their control. Divide the work into following phases:

1. **Literature Review:** Completing the state of the art and theoretical background.
2. **Conceptualization:** Refining the methodology, defining expected results, and preparing the implementation plan.
3. **Table of Contents:** Structuring the thesis and getting supervisor approval.
4. **Programming/Implementation:** Developing the proposed solution.
5. **Testing:** Evaluating the solution against defined criteria.
6. **Writing:** Drafting the thesis document, including analysis and discussion of results.
7. **Pre-Version Submission:** Submitting the draft version for supervisor feedback.
8. **Correction:** Incorporating feedback and making final improvements.
9. **Time Buffer:** Allocating extra time to handle unexpected delays.
10. **Final Submission:** Submitting the final approved version.

The project plan should be documented as a **Gantt chart** (see Fig. 2) and regularly updated throughout the thesis. This allows early detection of deviations, which must be discussed with the supervisor to assess their impact and necessary adjustments.

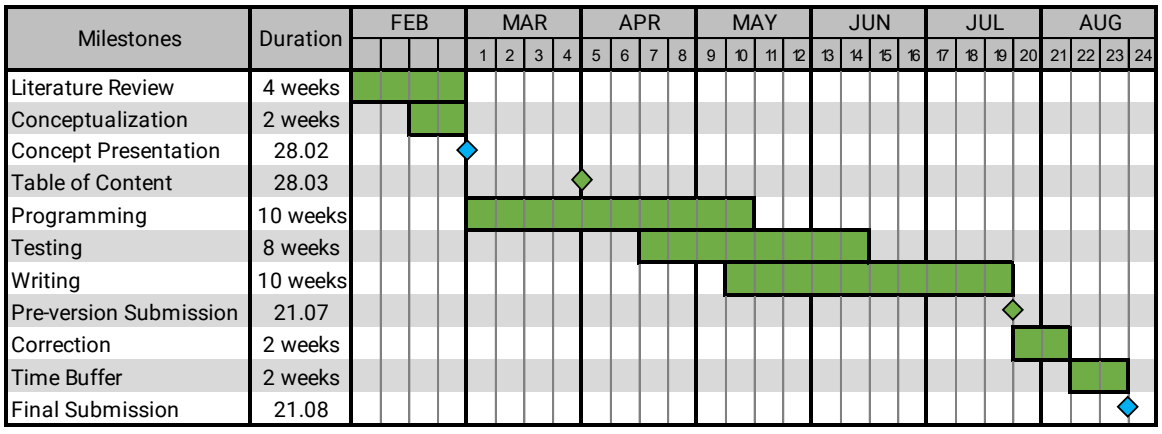

Fig. 2. Sample Gantt Chart

> ! The 📋**Gantt chart** must be submitted to ce-teaching@informatik.tu-chemnitz.de within ⏰ **1 week** after the *acceptance date*. Thesis work can only begin after the milestones have been formally specified and approved by the supervisor.

2.2.5. Concept Presentation

The Concept Presentation is a **mandatory** step in the thesis process at the **Professorship of Computer Engineering**. It serves as a **formal presentation** of the thesis concept, methodology, and planned realization. During this presentation, students outline their approach to solving the research tasks and justify their methodology. This step allows the supervisor and professorship to review, validate, and **confirm** the feasibility of the thesis before proceeding to the next phase.

> ! **Concept Presentation** must be presented no later than ⏰ **6 weeks** after the *acceptance date*. Upon a successful presentation, the student is allowed to officially register the thesis with the examination office (ZPA), and proceed with the thesis.

1. **Requirements:**
   - **Template:** Use the **professorship-provided** template without modification.
     - https://www.tu-chemnitz.de/informatik/ce/lectures/master.php.en#templates
   - **Academic Standards:** Content and presentation style must adhere to academic and scientific standards.
   - **Review:** Presentation slides must be reviewed and approved by the supervisor ⏰ **2 weeks** before the presentation date.
   - **Attendance Requirement:**
     - Students must attend at least **2 other concept presentations** from fellow students before their own presentatiom to learn the process.
     - A completed and signed 📋**Attendance Confirmation** must be submitted.
       - https://www.tu-chemnitz.de/informatik/ce/lectures/master.php.en#information
     - Failure to attend two presentations will result in a postponed concept presentation date.
   - **Slide Submission:** The final version of 📋**Concept Presentation Slides** and the 📋**Attendance Confirmation** must be submitted before the presentation day to:
     - ce-teaching@informatik-tu-chemnitz.de
2. **Scheduling Presentation:**
   - After all the stated requirements are met, an appointment for the concept presentation can be scheduled.
   - The Concept Presentation must be presented no later than ⏰ **6 weeks** after the *acceptance date*.
   - In the calendar provided at the professorship website students can find the next possible appointments for concept and defense presentations.

    - https://www.tu-chemnitz.de/informatik/ce/lectures/lectures.php.en#verteidigungen
  - Supervisor will schedule a time slot for the concept presentation and inform the student by email. Even the tentative Concept Presentation date is already defined in the 📋**Advisory Agreement**.
  - For an External Thesis, the participation of the external supervisor is required, and the student must inform them in advance.

3. The presentation has to cover the following points:
   1. **Introduction:**
      - **Background:** Provide context for the research and its domain.
      - **Problem Statement:** Define the specific problem or challenge addressed by the thesis.
      - **Motivation:** Explain the significance of solving this problem.
   2. **Fundamentals** (optional): Provide the key theoretical concepts necessary for the thesis.
   3. **State of the Art** (Literature Review): Review current research and methods related to the topic, highlighting gaps or limitations that the thesis aims to address.
   4. **Concept:** Outline the proposed approach or methodology for solving the problem, explaining why it was chosen and how it improves upon existing methods.
   5. **Implementation Plan:** Describe how the proposed method will be realized, including the tools, platforms, and technologies to be used, as well as the key steps involved.
   6. **Expected Results:** List the anticipated deliverables, such as a prototype, proof-of-concept system, theoretical model, or analytical results.
   7. **Evaluation Criteria:** Define the metrics and methods that will be used to evaluate the thesis results, including testing procedures and success criteria.
   8. **Timeline and Milestones:** Provide **gantt chart** for the thesis phases
   9. **Reference List:** Provide a properly formatted list of references for the literature and resources cited in the presentation.

4. **Presentation Process:**
   - **Presentation (20 minutes):** Deliver the prepared presentation to the examination committee and attendees.
   - **Q&A Session (10 minutes):** Answer questions from the examination committee, which may focus on the motivation, state of the art, concept, expected results or evaluation.

A successful presentation confirms readiness to proceed with the thesis. If revisions are required, they must be addressed promptly. In case of failure, the situation will be handled on a case-by-case basis, with further steps determined by the department.

2.2.6. Summary

The Conceptualization and Thesis Planning phase lays the groundwork for a successful Master's Thesis. By completing this phase, students:

- Gain a clear understanding of the current state of research and address any theoretical knowledge gaps.

- Define a clear and structured plan for their thesis, making sure it is both scientific and practical.
- Develop a detailed implementation plan and set realistic expectations for deliverables.
- Create a practical and adaptable timeline with milestones, accounting for potential risks.
- Validate the feasibility and alignment of the thesis through a formal Concept Presentation, enabling official registration.

This phase not only provides a roadmap for the thesis but also fosters confidence and clarity, ensuring smooth progress in subsequent stages of implementation and writing.

You must be prepared to give your presentation any day after the ⏰ **6-week** deadline. Failure to **submit your slides** on time, or to **confirm and present your concept within the assigned time slot**, will result in the **cancellation of your thesis**.

2.3. Official Registration

After successfully completing the Concept Presentation, the next step is to officially register the Master Thesis with the examination office (ZPA).

> **Registration** is a formal process that marks the official **start of the thesis** timeline. After the conceptualization phase, which concludes with the successful concept presentation, the thesis is officially registered with the Examination Office (ZPA), initiating the ⏰ **23-week Master's Thesis duration**.

2.3.1. Steps for Registration

1. **Prepare the Required Documents:**
   - **Registration Form:** Fill out the official 📋**ZPA Registration Form** provided by the Examination Office (ZPA), and bring it on the concept presentation. This form must include personal details, the thesis title, and the planned *start date*.
     - https://www.tu-chemnitz.de/zpa/formulare/allgemeineformulare/abschlussarbeit_anmeldung.pdf
   - **Additional Forms** (if applicable): For certain study regulations (e.g., 2016), a prefilled form with details such as name, date of birth, and matriculation number may also be required. Confirm this requirement with the supervisor.
     - https://www.tu-chemnitz.de/zpa/formulare/allgemeineformulare/Pruefungsvorleistung.pdf
2. **Submit to Supervisor:**
   - Send the completed and signed form to the supervisor for review and approval.
   - The supervisor may request corrections or additional information before submission.
   - Once approved, the supervisor will forward the registration form to the examination office (ZPA) on behalf of the student.
3. **Receive Confirmation:**
   - The Examination Office will review the documents and send an official confirmation of the thesis registration back to the supervisor.
   - This confirmation includes:
     - **Thesis title:** The officially registered title of the Master's Thesis.
     - Official ***Start Date*** (*Ausgabedatum*): The date when the thesis officially begins.
     - Final ***Submission Deadline*** (*Abgabedatum*): The latest date by which the thesis must be submitted, calculated based on the *start date* and the permitted duration.

2.3.2. Important Notes

1. **Formal Approval:** Registration is only possible after the Concept Presentation is successfully completed and approved.
2. **Final Deadline:** The *submission deadline* provided in the confirmation is final. Extension is rarely possible and only granted in exceptional cases and must comply with strict study regulations.
3. **Delays or Issues:** Any delays or issues during the registration process must be promptly communicated to the supervisor.

4. **No Changes Allowed After Submission:** Once the registration form is submitted, no changes to the thesis title or other details will be permitted.

2.4. Implementation

Once the thesis is officially registered, the next phase is focused on conducting the planned implementation. This phase focuses on carrying out the technical aspects of the thesis, turning the proposed method or concept into a practical solution.

2.4.1. Setting Up the Development Environment

- **Tools and Technologies:** Select appropriate tools, platforms, and technologies required for the implementation (e.g., programming languages, frameworks, simulation tools, hardware).
- **Resource Availability:**
  - Verify access to necessary datasets, hardware, or third-party services.
  - Address potential risks, such as delays in hardware or resource availability, by preparing contingencies.

2.4.2. Implementation Steps

- **Phased Approach:** Follow the roadmap and milestones defined during the planning phase.
- **Key Tasks:**
  - **System Design:** Finalize proposed system architecture or workflows, if not completed during the conceptualization phase.
  - **Development:** Write and integrate code, build hardware components, or create models as per the thesis requirements.
  - **Testing:** Perform incremental tests to verify the functionality of individual components.
  - **System Integration:** Combine components into a fully functional system and test their interaction.
- **Iterative Refinement:** Continuously test and refine the solution to address challenges and optimize performance.

2.4.3. Testing and Validation

- **Purpose:** Demonstrate that the solution achieves the intended goals through detailed testing and evaluation.
- **Testing Strategy:** Develop a plan for testing the solution, covering both:
  - **Functional Tests:** Verifying that the solution works as expected.
  - **Performance Tests:** Measuring metrics like speed, accuracy, or efficiency.
- **Evaluation Methods:**
  - Use already defined evaluation criteria (e.g., benchmarks, metrics) to assess success.
  - Compare results with existing systems or methods to highlight improvements or limitations.
- **Documentation of Results:**
  - Record test cases, observed outcomes, and analysis of results in a clear and structured manner.
  - Use visuals such as graphs, tables, or charts to present findings effectively.

2.4.4. Documentation of the Implementation

- **Process Documentation:**
  - Maintain detailed records of key decisions, challenges faced, and their resolutions.
  - Include any changes made to the original plan and the reasons behind them.
- **Code Documentation:**
  - Write clear, well-commented code to ensure future readability and usability.
  - Create a user guide if the system requires specific instructions for use.
- **Integration into Thesis:** Summarize the implementation process, outcomes, and validation in the Methodology and Results chapters of the thesis.

2.4.5. Supervisor Interaction

- **Regular Updates:**
  - Share progress updates with the supervisor to ensure alignment with thesis objectives.
  - Discuss challenges and significant deviations from the original plan.
- **Feedback Incorporation:** Act on feedback promptly to improve the implementation process and outcomes.

2.5. Writing

The written report is a crucial part of the Master's Thesis, requiring adequate time and attention. The writing phase focuses on presenting the analysis, implementation and results in a clear, structured, and academic manner. A well-written thesis not only documents the research and implementation process but also emphasizes the research component, your unique approach, and demonstrates critical thinking and scientific accuracy.

The Master's Thesis demonstrates your ability to present complex relationships in a structured and comprehensible way, with attention to formal accuracy, including correct spelling, punctuation, and referencing.

2.5.1. Writing Guidelines and Requirement

Scientific writing ensures that the thesis meets academic standards and presents research in a clear, structured, and professional manner. Follow these guidelines to maintain consistency and quality throughout your thesis.

- **Time Management:** Dedicate at least ⏰ **6 weeks** to writing to ensure the content is clear, well-structured, and polished.
- **Template:**
  - A template is provided for writing the thesis report and must be used without major modifications:
    - https://www.tu-chemnitz.de/informatik/ce/lectures/master.php.en#templates
  - Only reports based on the official template will be accepted.
- **Language:**
  - The thesis can be written in German or English.
  - Use formal, clear, and concise academic writing.
  - Avoid overly complex sentences and informal phrasing.
  - Maintain a neutral tone—do not use first-person language (e.g., "I" or "we").
- **Writing Approach:**
  - Follow a top-down structure: Introduce the problem first, break it down into steps, and describe these steps in detail.
  - Avoid starting with technical details and constructing the solution from them.
- **Length Guidelines:**
  - The recommended lenght of the thesis is approximately **80 pages** (excluding appendices).
  - While flexibility exists, theses shorter than 50 pages are rare, and exceeding 120 pages is difficult to justify.
- **Structure:** Subdivide the thesis into chapters, sections and paragraphs, limiting subdivisions to **three levels** except in exceptional cases.
- **Layout:**
  - Maintain a consistent layout, design and text style throughout the thesis.
  - Ensure uniform font size, line spacing, and heading formatting for a professional appearance.
  - Use high-quality visuals—avoid stretched, low-resolution, or unclear images.

  - Include relevant figures and tables, ensuring they are properly captioned and referenced in the text.
  - Use clear and consistent formatting for tables and figures.
  - Adhere to the IEEE standard for table and figure captions:
    - https://journals.ieeeauthorcenter.ieee.org/your-role-in-article-production/ieee-editorial-style-manual/
- **Referencing:**
  - Cite all sources appropriately and ensure consistent formatting throughout.
  - The citation and reference list must follow the IEEE standard:
    - https://journals.ieeeauthorcenter.ieee.org/your-role-in-article-production/ieee-editorial-style-manual/
- **Plagiarism:**
  - Maintain originality and properly cite all reused content or ideas.
  - Paraphrase carefully to avoid unintentional plagiarism—rewritten content must still be cited.
  - Credit all sources for figures, tables, and data—failure to do so is considered plagiarism.

2.5.2. Structuring the Thesis Report

Master's thesis report should follow a logical and structured format to ensure clarity, coherence, and adherence to academic standards. Each chapter should build on the previous one. Avoid referencing chapters that come later; instead, refer back to earlier chapters to connect current ideas with past results and maintain a clear, logical flow in your thesis. The following structure is recommended but may be adapted depending on the specific thesis topic. The thesis should follow the recommended logical structure:

- **Cover Page:** Use the template provided by the department to ensure that the title page layout adheres to TU Chemnitz specifications.
- **Table of Contents:** A structured outline listing all chapters, sections, and page numbers for easy navigation. The hierarchy should not exceed four levels, and each level must include at least two subchapters; otherwise, that level may be omitted.
- **List of Figures:** A compiled list of all figures used in the thesis, with corresponding page numbers.
- **List of Tables:** A compiled list of all tables used in the thesis, with corresponding page numbers.
- **List of Abbreviations** (if applicable): A list defining abbreviations and acronyms used throughout the thesis.
- **Abstract:** Brief summary of the entire thesis. including objectives, methodology, key results, and conclusions (typically 150-250 words).
- **I. Introduction:** Provide context for the research topic, such as the broader application domain at a high level.
  - **Motivation:** Explain the importance and relevance of the topic (see Section 3.3.2).
  - **Problem statement:** Clearly define the research problem that the thesis will address.
- **II. Fundamentals** (if applicable): Explain any fundamental theories, concepts, or models necessary to understand the thesis (see Section 2.2.2).
- **III. State of the Art** (Literature Review, see Section 2.2.2):

  - Summarize related research and existing solutions.
  - Highlight gaps in the existing literature that your work aims to address.
  - Include a paragraph discussing ongoing projects, research work, or demonstrator issues within the Professorship of Computer Engineering.
- **IV. Methodology** (see Section 2.2.3):
  - Describe the approach, techniques, and methods used in the research.
  - Explain the rationale behind the design choices.
  - Define data collection methods, algorithms, or experimental setups.
- **V. Implementation:** Focus on how the proposed method was developed and executed.
  - Detail the technical aspects of the solution. Explain the software, hardware, tools, and technologies used (see Section 2.2.3 and Section 2.4).
  - Describe how the methodology was applied in practice.
  - Include workflow diagrams, system architecture, or relevant technical details.
- **VI. Results and Evaluation:** Focus on presenting the outcomes and findings from the implementation.
  - Present the results of experiments, simulations, or evaluations (see Section 2.2.3).
  - Use graphs, tables, and figures to illustrate findings clearly.
  - Avoid analysis in this section—just report the facts.
- **VII. Discussion:** Analyze results, compare with existing solutions, and discuss limitations.
- **VIII. Conclusion:** Highlight the main contribution and key findings and propose future research directions based on the results.
- **References:** List of the cited sources in two groups:
  - **Reference List:** Includes all external references used in the thesis.
  - **Refenence from Professorship of Computer Engineering:** Lists publications, reports, or materials from the Professorship Computer Engineering respectively Chemnitz University of Technology. Have in mind it is also mandatory to have several publications referenced within the thesis.
- **Appendix** (if applicable): Include supplementary materials that don't fit in the main text—such as a glossary, technical documents (e.g., language syntax or definitions), extensive examples, essential algorithms, raw data, additional code explanations, configurations, user guides, installation instructions, or large tables (e.g., performance data).
- **Declaration of Originality:** It is mandatory to fill, sign and include the 📋**Selbständigkeitserklärung** form to confirm that the work is original.
  - https://www.tu-chemnitz.de/studentenservice/zpa/formulare/allgemeineformulare/abschlussarbeit_selbststaendigkeitserklaerung.pdf

The thesis should adhere to the recommended structure but may be adapted as needed based on the specific requirements of the thesis.

> ! The **main content** of the thesis, from the Introduction to the Conclusion, should be a **approximately 80 pages**.

2.5.3. Deliverables

During the writing phase, certain deliverables must be provided to ensure progress and alignment with requirement:

- 📋**Table of Contents**: Students must prepare it based on the recommended structure (Section 2.5.2) and have it confirmed by their supervisor. The finalized version must be submitted to ce-teaching@informatik-tu-chemnitz.de for review within ⏰ **6 weeks** of the *start date*.
- 📋**Reference List**: Along with the table of contents, students must submit a preliminary reference list for their thesis report. This should include all sources identified during the research phase and be sent to ce-teaching@informatik-tu-chemnitz.de at the same time as the Table of Contents.

Both deliverables should be completed and submitted promptly to ensure smooth progress in the thesis process.

2.6. Submission

The submission phase is one of the final steps in the thesis process. It ensures that the thesis meets academic and administrative requirements before it is formally submitted to the Examination Office.

2.6.1. Final Checks

Before submitting the pre-version of the thesis to the supervisor for review, students must ensure that it meets the following requirements:

- **Formatting:** Verify that the thesis adheres to the department's formatting guidelines:
  - Proper margins, fonts, and line spacing.
  - Consistent headings, subheadings, and numbering.
  - Correct placement of figures, tables, and captions.
- **Figures and Tables:**
  - Confirm all visuals are high-quality and properly labeled with captions.
  - Ensure every figure and table is referenced appropriately in the text.
- **References:**
  - Verify that all cited works appear in the reference list.
  - Check for consistent and correct formatting (e.g., IEEE style).
- **Language and style:**s
  - Proofread the thesis to eliminate grammar, spelling, and punctuation errors.
  - Use clear, concise, and formal academic language.
  - Avoid overly complex sentences and maintain a neutral tone.
- **Content:**
  - Ensure all sections required by the department's guidelines are included and complete.
  - Confirm that the thesis presents a cohesive narrative, with all arguments supported by evidence or references.

2.6.2. Pre-Version Submission (to the supervisor)

Before the final submission, students must submit a 📋**pre-version of the thesis** (draft version) to their supervisor for review. Review Process:

- Submit the pre-version at least ⏰ **3 weeks** before the *submission deadline* to ce-teaching@informatik-tu-chemnitz.de .
- The supervisor will review the draft for formatting, structure, content, and compliance with academic standards.
- The pre-version will be checked for plagiarism using external software.
- If the **plagiarism level** slightly exceeds the acceptable threshold, the student will be required to **revise and resubmit** the thesis. However, if the plagiarism level is significantly high, the thesis **will not be accepted** for submission.
- Only after positive feedback from professorship of Computer Engineering the thesis can be submitted in printed form to the examination office.
- Only after positive feedback from professorship of Computer Engineering the thesis can be submitted in printed form to the examination office.

2.6.3. Final Submission (to the Examination Office)

The 📋**final version of the thesis** must be submitted to the Examination Office (ZPA) by the *submission deadline*.

- **Submission Requirements:**
  - **Printed Copies:** Submit **2 bound copies** of the thesis. Ensure the binding is durable and professional.
  - **Digital Copy:** Provide following materials on a USB drive or CD:
    - PDF version of the thesis
    - Concept and Defense Presentation slides (if applicable)
    - Initial and Final Posters
    - Technical documentations (e.g. environment setup, requirements, configurations, …)
    - Source code
    - Relevant datasets
  - **Forms:** Attach any required forms, such as approval confirmations or signed declarations of originality.
- **Submission Process:**
  - Deliver all materials directly to the Examination Office (ZPA).
  - The submission must be completed on or **no later** than the date of the *submission deadline*.
  - Obtain a 📋**Confirmation of Final Report Submission**.
- **Late Submissions:** Submissions after the *submission deadline* are only accepted under exceptional circumstances with prior approval.

> ❗ Failure to submit the final thesis by the *submission deadline* will result in the thesis being graded as **failed**.

2.7. Defense

The defense is the final step of the thesis process, where students present their work, justify their methodology, and demonstrate their expertise in the subject area. This formal event includes a presentation, a question-and-answer session, and a discussion with the examination committee.

1. **Requirements**
   - **Template:** Use the **professorship-provided** template without significant modification
     - https://www.tu-chemnitz.de/informatik/ce/lectures/master.php.en#templates
   - **Academic Standards:** Content and presentation style must adhere to academic and scientific standards.
   - **Review:** Presentation slides must be reviewed and approved by the supervisor ⏰ **2 weeks** before the presentation date.
   - **Attendance Requirement:**

- Students must attend at least **2 other defense presentations** before their own to learn the process.
- A completed and signed 📋**Attendance Confirmation** must be submitted.
  - https://www.tu-chemnitz.de/informatik/ce/lectures/master.php.en#information
- Failure to attend two presentations will result in a postponed defense date unless an exemption is approved by the supervisor.
- If unavailable, students must request alternative arrangements in advance.

- **Slide Submission:** The final version of 📋**Defense Presentation Slides** and the 📋**Attendance Confirmation** must be submitted before the presentation day to:
  - ce-teaching@informatik-tu-chemnitz.de

2. **Scheduling Presentation:**
   - After all the stated requirements are met, an appointment for the defense presentation can be scheduled.
   - The Defense Presentation must be presented within ⏰ **4 weeks** after the *submission deadline*.
   - In the calendar provided at professorship website students can find the next possible appointments for concept and defense presentations.
     - https://www.tu-chemnitz.de/informatik/ce/lectures/lectures.php.en#verteidigungen
   - Supervisor will schedule a time slot for the defense presentation and inform the student by email.
   - For an External Thesis, the participation of the external supervisor is required, and the student must inform them in advance.
3. **Content:**
   1. **Introduction** (brief): Provide context, explain the motivation, and state the research problem.
   2. **State of the Art** (brief): Summarize related research, existing solutions, and gaps.
   3. **Methodology** (brief): Provide an overview of the approach or solution, including design and theoretical considerations.
   4. **Implementation:** Describe how the proposed solution was realized, highlighting technical steps and tools.
   5. **Results and Evaluation:** Present key findings using visual aids (e.g., graphs, charts, or tables) and discuss how the solution performed based on evaluation criteria.
   6. **Discussion:** Analyze the results, addressing strengths, limitations, and comparisons to existing work.
   7. **Conclusion:** Summarize contributions and propose potential future work.
   8. **Demonstrator** (if applicable):
      - It is recommended to include a short demonstration video showcasing the implementation or solution outcomes, especially for software or hardware-based projects.
4. **Presentation Process:**
   - **Presentation (30 minutes):**
     - Deliver the prepared presentation to the examination committee and attendees.

    - Present clearly, confidently, and in an engaging manner while focusing on key points.
- **Q&A Session (30 minutes):** Answer questions from the examination committee, which may focus on:
    - Justifying the methodology.
    - Explaining key decisions or challenges.
    - Explaining the tests or evaluations.
    - Addressing potential limitations or future work.

A mock presentation can be arranged upon the student's request. To schedule one, send an email to your supervisor and ce-teaching@informatik.tu-chemnitz.de at least 10 working days before the final *submission deadline* of your Master's Thesis.

If all required documents (presentation slides and proof of thesis attendance) are not submitted at least ⏰ **10 working days** before the scheduled presentation date, your appointment will be canceled.

Failure to present the defense within the scheduled time slot or within ⏰ **4 weeks** after the final submission will result in the thesis being graded as **failed**.

3. Additional Guidelines

3.1. Important Dates

Below is a list of the key dates for the Master's Thesis process (TABLE I):

1. **Acceptance Date:** The date when the thesis topic is officially accepted by the professors and the Advisory Agreement is signed.
2. **Concept Presentation Date:** The planned date for the concept presentation.
3. **Start Date** (also known as Registration Date): The date when your thesis officially begins, as recorded by the Examination Office (ZPA) on your registration and confirmation documents.
4. **Submission Deadline:** The last date by which the thesis must be submitted.
5. **Defense Presentation Date:** The planned date for the defense presentation, occurring after the final submission.

TABLE I
KEY DATES IN THE THESIS PROCESS

Nr.	Dates	Relation
1	Acceptance Date	ACD: Starting point for all deadlines.
2	Concept Presentation Date	CPD = ACD + 6 weeks
3	Start Date	STD = ACD + 6 weeks
4	Submission Deadline	FSD = STD + 23 weeks
5	Defense Presentation Date	DPD = FSD + 4 weeks

3.2. Formal Documents and Deliverables

Below is a list of essential formal documents and deliverables. TABLE II summarizes the deliverables deadline.

1. **Topic Description:** Formal outline of your research problem, objectives, scope, and expected deliverables.
2. **Registration Form:** Form with personal details, thesis title, and planned start date for official registration.
   - Download link: https://bildungsportal.sachsen.de/opal/FolderResource/10056597504/Registration/Vorlage_Extern_Englisch.docx
   - Submit to: OPAL course
3. **Transcript of Records** (PDF from SB Service): Current PDF of your credit points from the SB Service.
   - Submit to: OPAL course
4. **Advisory Agreement:** Signed agreement confirming topic approval and advisor roles.
   - Download link: https://www.tu-chemnitz.de/informatik/ce/lectures/master.php.en#information
   - Submit to: ce-teaching@informatik-tu-chemnitz.de
5. **Initial Poster:** Public overview summarizing motivation and objectives, created using the provided template and poster generator.

- Template download link: https://www.tu-chemnitz.de/informatik/ce/lectures/master.php.en#templates
- Poster Generator link: https://printgenerator.tu-chemnitz.de
- Submit to: ce-teaching@informatik-tu-chemnitz.de

6. **Gantt Chart:** Detailed project plan outlining phases, milestones, and deadlines.
   - Template download link:
   - Submit to: ce-teaching@informatik-tu-chemnitz.de
7. **Concept Presentation Slides:** Slides for the mandatory concept presentation following the provided template.
   - Template download link: https://www.tu-chemnitz.de/informatik/ce/lectures/master.php.en#templates
   - Submit to: ce-teaching@informatik-tu-chemnitz.de
8. **Attendance Confirmation for Concept Presentations:** Document confirming attendance at at least two concept presentations.
   - Download link: https://www.tu-chemnitz.de/informatik/ce/lectures/master.php.en#information
   - Submit to: ce-teaching@informatik-tu-chemnitz.de
9. **ZPA Registration Form:** Confirmation from the Examination Office (ZPA) marking the official start of your thesis.
   - Download link: https://www.tu-chemnitz.de/zpa/formulare/allgemeineformulare/abschlussarbeit_anmeldung.pdf
   - Submit to: ce-teaching@informatik-tu-chemnitz.de
10. **Table of Content:** Structured outline of your thesis report, listing chapters and sections.
    - Submit to: ce-teaching@informatik-tu-chemnitz.de
11. **Reference List:** List of the cited sources.
    - Submit to: ce-teaching@informatik-tu-chemnitz.de
12. **Pre-version of the Thesis:** Draft version of your thesis report for supervisor review.
    - Template download link: https://www.tu-chemnitz.de/informatik/ce/lectures/master.php.en#templates
    - Submit to: ce-teaching@informatik-tu-chemnitz.de
13. **Final Poster:** Public overview summarizing concept, implementation and results, created using the provided template and poster generator.
14. **Declaration of Originality:** A mandatory signed document confirming that the work is original
    - Download link: https://www.tu-chemnitz.de/studentenservice/zpa/formulare/allgemeineformulare/abschlussarbeit_selbststaendigkeitserklaerung.pdf
    - Submit to: Include in final report
15. **Final version of the Thesis:** Completed thesis report in printed (2 bound copies) and digital formats.
    - Submit to: Examination Office (ZPA)
16. **Attendance Confirmation** for Defense Presentations: Document confirming attendance at at least two defense presentations.
    - Download link: https://www.tu-chemnitz.de/informatik/ce/lectures/master.php.en#information
    - Submit to: ce-teaching@informatik-tu-chemnitz.de

17. **Defense Presentation Slides:** Final presentation slides for the thesis defense.
    - Template download link:https://www.tu-chemnitz.de/informatik/ce/lectures/master.php.en#templates
    - Submit to: ce-teaching@informatik-tu-chemnitz.de

TABLE II
IMPORTANT DOCUMENTS

Nr.	Documents	Deadlines
1	Topic Description (for External Thesis)	ACD - 4 weeks
2	Registration Form	By register at the OPAL course
3	Transcript of Records	By register at the OPAL course
4	Advisory Agreement	ACD
5	Initial Poster	ACD + 1 week
6	Gantt Chart	ACD + 1 week
7	Concept Presentation Slides	CPD - 2 weeks
8	Attendance Confirmation for Concept Presentation	Before CPD
9	ZPA Registration Form	STD
10	Table of Contents	STD + 6 weeks
11	Reference List	STD + 6 weeks
12	Pre-version of the Thesis	FSD - 3 weeks
13	Final Poster	FSD - 2 weeks
14	Declaration of Originality (include in final report)	FSD
15	Final version of the Thesis	FSD
16	Attendance Confirmation for Defense Presentation	Before DPD
17	Defense Presentation Slides	FSD + 4weeks

3.3. Hints

3.3.1. Writing Introduction

The introduction chapter is your opportunity to set the stage for your entire thesis. Its purpose is to:

- **Engage the Reader:** Capture interest by clearly explaining why your research topic matters.
- **Provide Context:** Offer the background and necessary context that frames your research.
- **State Motivation:** Clarify the importance of the topic and the gap your study aims to fill.
- **Define the Problem:** Present a clear problem statement that outlines the research challenge you intend to address.
- **Outline the Thesis:** Give a brief overview of the structure and flow of your thesis.

Think of the introduction as a roadmap that not only informs the reader about what to expect but also highlights the significance of your study right from the start. Use a concrete example to illustrate the topic, and refer back to this example in the results chapter to tie the narrative together.

3.3.2. Writing Motivation

Your thesis motivation should clearly define the purpose of your research. It is a part of the introduction chapter. A well-defined motivation follows the SMART principle:

- **Specific:** Clearly articulate the research goal.
- **Measurable:** Ensure that outcomes can be quantified or evaluated.
- **Attainable:** The goal must be realistic within the given timeframe and resources.
- **Relevant:** Align the research with academic and industry needs.
- **Time-Bound:** Establish deadlines and milestones to track progress.

A strong motivation provides context for the research problem and highlights its significance.

3.3.3. Literature Research

A literature review involves gathering relevant sources to understand existing research, identify gaps, and position your thesis within the academic field. Various resources can be used:

- **University Library Catalog:** Search for books, reference materials, and previous theses using the TU Chemnitz library catalog. While books provide extensive content, they may lack the latest research.
  - https://katalog.bibliothek.tu-chemnitz.de/
- **E-Books:** Access electronic books through the university's e-media portal.
  - http://www.tu-chemnitz.de/ub/suchen-und-finden/emedien/ebooks/ebooks.html
- **Scientific Journals:** Explore peer-reviewed publications for cutting-edge research. Major computer science journals include:
  - **IEEE Xplore**
  - **Communications of the ACM**
  - **GI-Informatik Spektrum**: TU Chemnitz provides access to electronic journals.
    - http://www.tu-chemnitz.de/ub/suchen-und-finden/emedien/ejournals/ejournals.html

- **Conference Proceedings:** Papers from conferences and workshops often present the latest developments but may reflect work-in-progress rather than final research.
- **Databases:** Specialized databases such as DBIS provide curated research materials.
  - https://dbis.uni-regensburg.de/TUCHE/browse/subjects/20/
- **Internet Research:** While online sources can offer valuable insights, ensure credibility and cite only authoritative sources.

In the "State of the Art" or "Fundamentals" chapter, include a paragraph summarizing ongoing projects, current research, and demonstrator challenges within the Professorship of Computer Engineering.

3.3.4. Formulating the Research Question

A well-defined research question is essential for structuring the thesis. The research approach should be based on existing literature and must involve systematic evaluation.

- **Developing Your Own Approach:** Your solution should be methodologically sound and build on insights gained from the literature review. Use formal methods to describe your approach:
  - Mathematical models
  - Entity-Relationship diagrams
  - UML diagrams or Petri nets
  - Data flow diagrams and graphs
  - Circuit schematics (if applicable)
- **Evaluating Your Approach:** Evaluation methods depend on the type of work:
  - Qualitative: Analyze how your solution compares to existing methods in terms of usability, functionality, and flexibility.
  - Quantitative: Measure performance metrics such as accuracy, runtime, or resource usage.
- **Structuring the Research Process**: The overall process should adhere following steps:
  - Solution Conception: Define the theoretical framework.
  - Implementation: Develop the proposed method.
  - Testing & Application: Apply the approach to real-world examples.
  - Results Documentation: Analyze findings and present conclusions.

3.3.5. Writing the Thesis

Writing is not just about documenting results, it reflects your ability to present complex information clearly and logically.

- **Structuring the Thesis:**
  - Chapters should build on one another; avoid referencing later chapters.
  - The main chapters should present the chosen working method and the achieved results using a **top-down** approach rather than a **bottom-up** development history.
  - Ensure each chapter or subchapter is at least half a page long.
  - Begin each chapter with a **brief overview** of its content and objectives.
  - End each chapter with a **concise summary** of key points (no more than half a page).
  - Make the introduction and concluding chapter (summary/outlook) **self-contained** and understandable on their own, even without the reading the complete chapters.

  - Conclude the thesis with a **summary** and a brief **outlook** that restates key findings (without readdressing the achievement of the results) and discusses potential extensions, demonstrating your ability to generalize or apply your approach to other areas.
- **Writing Style and Tips**
  - Maintain consistent formatting and adhere to the professorship's template.
  - Avoid **overly long** sentences and complex constructions.
  - Avoid **exhaustive lists** such as detailing every construct of a programming language or every function of a system—in the main chapters. Instead, reserve such detailed descriptions for the appendix, using the chapters to explain and illustrate key concepts.
  - Minimize the use of **passive voice**.
  - Include **examples** to clarify key points.
  - Place code listings or detailed configurations in the appendix, unless they are central to your argument.
  - Ensure all figures and tables are referenced in the text and accompanied by clear, explanatory captions.

3.3.6. Presentations

Presenting your work effectively is a crucial part of your Master's Thesis. Your presentation should demonstrate technical depth, clear communication, and the ability to answer questions concisely. The following guidelines apply to both the Concept Presentation and the Defense Presentation.

- **Students should focus on three main aspects:**
  - **Slide Quality & Technical Depth:** Ensure slides are well-structured, visually clear, and highlight key points concisely.
  - **Speech & Delivery:** Present in a structured manner, maintaining a steady pace and clear articulation.
  - **Q&A Session:** Answer questions confidently, concisely, and, when relevant, with supporting slides.
- **Proper time management is essential to avoid penalties:**
  - **Overlong Presentations:** If the student exceeds the allocated time, the presentation will be interrupted, which may negatively affect the evaluation.
  - **Underutilized Time:** If the presentation is significantly shorter than required, the grade will be adjusted accordingly.
- **Handling the Q&A Session:**
  - Listen to each question carefully and patiently before answering.
  - If unclear, ask for clarification before responding.
  - Provide concise and structured answers, referring to the relevant slides when necessary.
  - Students may prepare **backup slides** to support technical explanations without overloading the main presentation.
- **Online Presentations:**
  - For online presentations, TU Chemnitz uses the **BigBlueButton** (BBB) platform. Students should ensure a smooth presentation by following these guidelines:

- **Preparation:**
  - Join the presentation room 15 minutes before the scheduled start time.
  - Ensure a stable internet connection and test audio, video, and screen sharing settings in advance.
  - Use a high-quality microphone and headphones to minimize noise, echo, and audio issues.
- **During the Presentation:**
  - Keep the presentation in full-screen mode throughout the talk and Q&A session.
  - Enable your camera during the defense presentation.
  - Minimize distractions by hiding unnecessary pop-ups and notifications.
  - Press the "Hide" button on the BigBlueButton pop-up when screen sharing to improve visibility.

- **In Presence Presentations:**
  - Student should come to the presentation room 15 minutes before the scheduled start time to prepare the presenatation setup.
  - Student must distribute 5-10 printed copies of your 📋**Final Poster**, in A4 black & white, to the audience before your presentation.