



Joint International Master's Programme

Information Technology

Master Thesis Briefing Pack

Lemgo

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Learning Outcomes

The MSc Information Technology Thesis is designed to encourage students to investigate an scientific subject of their choice in significant depth to produce a not more than 100 pages thesis and an oral presentation. On completion of the unit the students will be able to:

- 1 Demonstrate an enhanced capability to define a research or development oriented academic topic in detail, select an appropriate methodology, construct a hypothesis, undertake a literature search which includes research publications, collect primary data, critically appraise literature and data, propose a new/improved model for application and testing, and produce meaningful conclusions.
- 2 Initiate, plan, organize and manage a research or development study.
- 3 Produce a well-conceived thesis of not more than 100 pages within an agreed time scale.
- 4 Introduce scientific research techniques into professional investigations.
- 5 Present the important results during a presentation of at least 20 minutes duration (one student) or 40 minutes (2 students), which should be in English. Questions will be asked after the presentation. The time for questions shall not exceed 15 minutes (one student) or 30 minutes (2 students). If agreed by the local programme management, the language of the local institution can be used.

Master Thesis Project Organisation

The projects are carried out individually or in project groups of two students, so that individual contributions can be identified and evaluated. Each project group is assigned a supervisor who is an active researcher or teacher with research competence at the university where the project is to be performed.

The topic of the master thesis shall be within the area covered by the master program. The project shall be research oriented with connection to the research at the university where it is performed. The work shall to the larger part be carried out independently. The project includes a substantial literature search which must well cover the topic of the project. The project must have a clearly identifiable **research question**.

Students will be expected to choose their thesis topic and initiate the project towards the end of the third semester.

Thesis work at one of the four Universities is preferred. Work at companies should be an exception. Conditions for work at companies are:

- Content should follow an academic/scientific approach.
- Product development shall not be considered.
- Scientific supervision is task of local University.
- Monthly progress reports at local University necessary.

Thesis Work in Lemgo

The Thesis work in Lemgo shall follow the following steps:

Step 1: preparation

The supervisor needs all data from the student: name, address, email, phone etc. and would like to have a picture. A working place will be assigned by the supervisor. The topic for the thesis is a preliminary "working topic".

Step 2: Master Thesis Proposal (2-4 weeks)

What is expected?

The thesis proposal, which is the blueprint of the study, should at least contain the sections below. What interests the supervisor is to know whether you have done sufficient work, and have the necessary background and knowledge, and whether the study is feasible. Most important, the study must make an important and original contribution to science/theory. The proposal should be about 2-4 pages. It should include the following points:

- 1. Title**
The title should clearly and succinctly convey the essence of the study.
- 2. Research problem/research questions/hypotheses/significance.**
Here, the research problem that you seek to address should be made clear. What is the puzzle that you are trying to solve? Why is it a puzzle? Try to write the research problem in question format. The research problem should be very pointed and focused, but not to the extent that it becomes trivial. You must identify why the problem is important (the questions that usually come to mind when reading problem statements are: "so what, who cares, what difference will it make to society"?) In other words, the study should clearly be important and make some unique/significant contribution to theory and practice. What are the hypotheses that will be tested (i.e., a statement, in null or substantive form, indicated a relation or difference between the variables)?
- 3. Background to the study**
The literature reviewed (cite about 5-10 sources from peer-reviewed journals of International repute (e.g. IEEE xplore)) should provide a strong enough theoretical and empirical foundation to support section 2 above (i.e., the research problems/questions should be distilled and naturally follow from the literature, which will also guide the hypotheses that need to be tested and predict the outcome of the study) and to set the tone of the study. The literature reviewed should provide the basis for the gap that you intend to fill with your study.
- 4. Method and design**
The design of the study is essential in terms of what type of data will be gathered, how it will be gathered, and the data-gathering instrument will be used. The intended sample must be clearly identified and justified. The data-analysis method must be clearly stated and justified, and support the hypotheses that are to be tested.
- 5. Anticipated findings and implications**
This section must logically follow from the literature review and the hypotheses. Provided you have strong theory, you must be able to predict the outcomes of the study. Implications for theory and practice must be clearly made.

6. **References**

References/citations (and the style of the proposal) should follow the IEEE guidelines (http://www.ece.uiuc.edu/pubs/ref_guides/ieee.html)

7. **Time schedule**

Structure your project into work packages, estimate the needed time and put them in sequence.

Supervisor and student will agree on this Research Proposal.

Step 3: Training (2-4 weeks)

It might be necessary to learn some special things and to gain special know how. This step is also normally done during the time between the 3. and 4. Semester

Result:

Student can check, if aim can be reached.

Step 4: official thesis (4 month , should be finished before 25th August !)

The substantial research will then be carried out during the fourth semester.

The following things have to be fulfilled:

- The student has got 30 credits from the 1st semester courses
- The student has got 30 credits from the 2nd semester courses
- The student has got at least 24 credits from the 3rd semester courses
- The title for the thesis has to be agreed between student and supervisor
- The student has to apply officially for the thesis work at the examination office. Forms can be found at: http://www.ee.fh-lippe.de/labor/dk/Exam/forms_en.php
- The submission date (final date) will be defined in this application.

Requirements during this time:

- At least all 2 weeks 1 hour discussion on the project with the supervisor to follow the progress
- It is a scientific work. Therefore an intensive literature research has always to be done. The library in Lemgo gives very good online access to important databases (e.g. IEEE)
- For questions and problems try to contact the supervisor as soon as possible
- Students will be strongly encouraged to write work up as it is carried out rather than leave everything to the end. The supervisor will give comments on drafts as they are prepared.
- Start the writing process at least 6 weeks before the final date.
- The supervisor would like to have a part of the thesis to read at least 5 weeks before the final date! He will give feedback!
- The supervisor would like to read the **introduction and the summary** two weeks before the final date.

Step 5: write thesis

For the written thesis we have some general recommendations, which should be followed by all students:

- General Rule: A colleague should be able to understand the thesis, even if he is no specialist on that topic.
- You have to use some official pages which can be found on the Web site of the Examination office http://www.ee.fh-lippe.de/labor/dk/Exam/forms_en.php
- Use Font size 11 or 12
- Less than 100 pages (typically 60 – 80)
- All data and documents have also to be submitted on a CD
- You have to agree with your supervisor about the public part of the thesis. This part will be published in the local library. If your thesis includes specific parts which shall not be published, they have to be included in an appendix . This has to be agreed with the supervisor.
- The public part of the thesis has also to be submitted as **pdf** document to the head of the examination office.

Further points for the written parts should be considered:

- The description under a picture should always be in a way, that the picture can be understood by reading this description. For each picture or table in the document, there must also be a reference to this picture / table in the text.
- Abbreviations have to be introduced before they are used.

The following structure has to be used:

- Own First Page (e.g. with thesis special picture)!
- Official start pages
- Abstract
- Content list
- symbols / abbreviation list
- picture- and table-List
- Introduction
- own chapters
- Summary
- References
- Appendix

Step 6: Oral Assessment

Attention!

This part can only be done, if the Student has got 30 credits from the 3rd Semester

The thesis shall be presented and defended at a public seminar with an opponent. The opponents shall have several years experience of research or development in the field of the thesis. External opponents are to be preferred.

Each thesis will be examined and graded by the supervisor in consultation with the opponent and the programme co-ordinator. There will be one thesis grade which considers the work, the written part and the presentation. A written assessment of no more than one page of A4 has to be provided by the supervisor (only in Lemgo). This will contain:

- the applied grading,
- the progress of the student during the duration of the project,
- and the quality of the written part.

The allocation of marks will be based on the criteria given on the Assessment Sheet included as part of the Thesis Briefing Pack. Marks will not be specifically allocated to sub-sections but allocations to the four main criteria will be almost equally balanced in weighting.

All theses will be made available to the public through the library at the local university. Any part of the work that is to be confidential cannot be included in the written thesis. This gives the possibility to have a confidential part of the work. This will still affect the grading since it will be known by the supervisor and it can even be included at the oral presentation if a confidentiality agreement is signed by the audience.

Appendix: Grading Scheme

Name

Registration No.:

Colloquium:

	poor	medium	good	very good	result
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Work content					50%
Expertise	not sufficient, only solution attempts	problems are solved partially, way of solution critically analyzed, medium results	Good solution of problems, clear proof if solution is not possible	Perfect solution and proof for unattainable solution and additional aspects	20%
	0 - 5	6..10	11..15	16 - 20	
Usage of methods and tools	work without concept, goal oriented work not visible	methods and tools only partially used	good usage of methods and tools	perfect usage of methods and tools and critical deduction	10%
	0 - 3	4..5	6..8	9 - 10	
Literature study, usage of specialized knowledge	poor, no relevant references	partially	good	extensive and critical references	10%
	0 - 3	4..5	6..8	9 - 10	
Can results be applied?	no usage	modifications necessary	only few modifications necessary	perfect realization	10%
	0 - 3	4..5	6..8	9 - 10	

Systematic and creativity					25%
Independent work, own initiative	poor, always waiting for guidance	certain level of independent work, little guidance necessary	high level of independent work, initiative shown	completely independent and high level of initiative	15%
	0 - 4	5..8	9..12	13 - 15	
Creativity	no own ideas, unable to apply known solutions to an actual problem	less own ideas, ability to apply solutions with little guidance	many own ideas which can be transformed and applied	many own ideas, comparisons and evaluations with existing solutions	10%
	0 - 3	4..5	6..8	9 - 10	

Written report					25%
Problem analysis	problem not identified	problem analysis with defects	problem analyzed well	problem analyzed with insight to other dependencies	5%
	0 - 2	3	4	5	
Comprehension, writing style, quality	poor, essential elements are missing, articulation errors	comprehension sufficient, insufficient amount of graphs or illustrations	good, only minor elements missing, no substantial errors, sufficient amount of graphs and illustrations, less articulation errors	perfect, new graphics and illustrations, almost no articulation errors	5%
	0 - 2	3	4	5	
Entirety	essential parts are missing	sufficient project description, papers' list and index partly exist	almost all parts are addressed, complete project description, papers' list and index exist	complete and precise project description with exemplary source quotations, lists and technical papers	10%
	0 - 3	4.5	6..8	9 - 10	
Critical analysis and evaluation of results	no critical analysis or evaluation	critical analysis with insufficient relevance	critical analysis with relevance	Thesis tasks and results are analyzed and evaluated well. Further perspective is shown.	5%
	0 - 2	3	4	5	

Total points (without extra points)	0
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Extra points 0
Sum **0**

grade	1	1.3	1.7	2	2.3
points	98-100	93-97	87-92	82-86	77-81

grade	2.7	3	3.3	3.7	4
points	71-76	66-70	61-65	55-60	50-54

grade	fail
points	< 50

10 extra points will be awarded, for a peer reviewed accepted journal contribution or conference paper.