

Berufsakademie Mannheim
University of Co-operative Education
Department of Information Technology (International)

**Guidelines for the Conduct of
Independent (Research) Projects**

5th/6th Semester

1.) Objective:

Quoted from the current (BA) ITI-Curriculum: “...

14. Individual Projects / Scholarly Paper

Learning objectives

- V covering an interdisciplinary theme: to apply scientific methods and additionally personal / methodological skills beyond strictly engineering ones
- V to apply project management methods to plan and implement the project
- V to be able to use a comprehensive engineering knowledge, bringing a problem to a solution, weighting the alternative professional solutions
- V to present the findings in the form of a scholarly paper [Individual Projects]

5th/6th semester (2+4 hours/week, certification of successful participation + scholarly paper)

Notes on methodology

- V The scholarly paper [Individual Projects] extends over the 5th and 6th semester, with the total volume of working time amounting as a rule to 120 hours (plus any preliminary and review work).
- V The portions devoted to the 5th and 6th semesters can be thematically related; here the 5th semester should mainly be devoted to project planning and the 6th semester to implementation. After the 5th semester a certification of successful participation will be written as a measure of achievement.
- V The grade for the subject refers to the entire paper (5th and 6th semester).
- V A complex topic can be worked on by more than one student, if possible based on experience in several companies. Here, the individual tasks must be defined in such a way as to make it possible to grade each student separately and to recognize which student did what parts.
- V The evaluation should be based on the evaluation criteria for the dissertation.

.....” Quotation end. Please review the currently assigned number of hours per week for your project and remember to multiply it by a factor of at least 2 (See: IT/ITI Study Regulation)!

2.) How to select a Subject/Topic:

First ask your Academic Advisor for a suggestion. Or, if you have a good idea, prepare a brief summary or outline of your topic and discuss it with your Academic Advisor whether it is adequate and feasible (in terms of Lab-resources). Practical work should only start after approval.

3.) Individual vs. Group Projects:

Projects conducted in groups are perfectly acceptable, but keep in mind:

- management and communication overhead increases with the number of group members
- if you expect individual grades all parts of the final presentation have to be distinguishable and the Supervisor has to agree
- volume, quality, quantity and the scope of the topic have to be adequate to the number of students working on it (N x 120 hours +++)
- Do not blame the others at the end!

4.) Resources:

Be realistic about your approach, the BA is not NASA or the MIT and you are not the one student! Still, once the project has been approved, there are funds to purchase the necessary equipment.

The Lab- Engineers are the ones to speak with and they will approve the orders of the requested materials, either HW, SW, components or boards. Parts bought without previous permission may not be refundable later!

Especially schematics or PCB designs need reviews and approvals from the Lab-Engineers prior manufacturing.

All electronic circuits should thoroughly be simulated (if possible) and “bread boarded” as well as tested before the final soldering takes place.

The usage of specialized Lab-equipment should be timed and planned well ahead (there are always bottlenecks).

For Software projects: Thorough testing and several installations on different target systems should be conducted prior to “V1.0”! Tests, only on the development system are not sufficient.

If your software shall provide services accessible over the BA-network the delivery platform is one of the available Lab-servers. Develop your software to be compatible with these system environments (OS, Web- and DB-server, network services etc.).

The BA can and will not provide individual server systems for each project; development- and test - systems are perfectly acceptable and should be deployed.

5.) Declaration (Statement) of Academic Honesty:

It is perfectly acceptable to use all legally available sources of information to optimize the success of the project, but copyright violations and plagiarism will inevitably cause a “fail” in the final grade for all participants. Text- and software- quotations (“reuse”) are quite common and ok.

6.) Deadline of the Project:

If not explicitly stated differently by the Supervisor the project is due 3 weeks before the lectures of the 6th semester end. Be prepared to give a 10 to 15 minutes presentation about the conduct and the results of your project. The actual date of the deadline will be posted well in advance every year. On that date all materials belonging to the project have to be submitted to your Supervisor, so a feedback (except of the grade) is possible prior to your departure.

7.) Relevant Criteria for the Grading of a Project:

Each Supervisor may apply his/her own grading scheme and is not obliged to present it (beside the standard BA-Regulations for project evaluation). So the following criteria are only hints and one possible approach.

- 1.) Architecture and completeness of the paper in terms of theoretical and practical results
- 2.) Complexity of the topic / problem at work
- 3.) Professional conduct of the (research) work
- 4.) Creativity in finding solutions and soundness in selecting the most adequate one
- 5.) Functionality and reliability of the "product"
- 6.) Economicalness of the solution selected
- 7.) Value / gain added by the solution / product
- 8.) Presentation and writing style of the final paper
- 9.) Proper and adequate literature review and quotations
- 10.) Compliance with the deadline(s)

8.) Basic Architecture of a research Paper

Analogy: „Tower of: Hanoi, Pisa, Babel or Eiffel "?

1. Problem Definition
2. What shall be made and what shall be excluded?
3. Essential Theory ()
4. Practice
|
5. The Product!
System
6. Synthesis / Evaluation
Summary, conclusions
Critical consideration
7. Appendix ()
A:
B:
C:

The following list describes the usual building units / modules of a paper. These are NOT the headlines of the modules!

Cover sheet

Declaration of academic honesty

Table of contents

Picture list

Abbreviations

Preface (why was the work written? a general overview)

1. Introduction (precise problem definition, what shall be done and what not?)
2. Theory, basics, prerequisites and a general solution design, theoretical processing of the problem
3. Experiment construction, work surroundings, tool, methodical solutions and system design in general

4. Conception, design and architecture of the system (construction, module plan, circuits, diagrams etc. with explanations)
 5. Aspects of the realization, results of experiments, data, usage and handling of the system, features, functions, specifications, tests, user documentation
 6. Summary, conclusions, evaluations, critical review, assessment and outlook
- Literature and sources
- Appendices (source code, tables, no diskettes or CDs, collection of important additional information)

General Remark:

Make sure that your personal contributions and creative solutions you are presenting are differentiable from credit you have to give to other people's work. Explicitly point out, or quote, who has contributed to the contents of your paper.

Die 20 goldenen Regeln für Studienarbeiten

Zum Inhalt

1. Die Arbeit beginnt mit einem Management Summary (dt.&engl.)
2. Überprüfbare Ziele sind zu definieren und darzustellen
3. Der wissenschaftliche Kontext wird ausführlich diskutiert
4. Ein nachvollziehbares Vorgehensmodell ist zu wählen und durchzuhalten
5. Mindestens 10 Bücher oder wissenschaftliche Arbeiten sind zu zitieren
6. Die Programme sind zu dokumentieren und auf CD auszuliefern

Zur Beachtung

7. Du sollst keine fremden Texte und Programme als Deine eigenen ausgeben
8. Du sollst die Betreuer und Labor-Ingenieure nicht mit Trivialitäten belästigen
9. Es sind 2 x 88 Stunden vorzusehen und ein Arbeitsplan ist zu erstellen
10. Mindestens 5 Termine mit dem Betreuer sollten wahrgenommen werden

Zur Orientierung

11. Arbeiten von weniger als 20 Seiten pro Person sind nicht akzeptabel
12. Arbeiten mit sprachlichen und graphischen Mängeln sind nicht akzeptabel
13. Arbeiten, die dem Betreuer nicht präsentiert wurden, sind nicht akzeptabel
14. Arbeiten, die nicht portiert werden können sind, sind nicht akzeptabel
15. Arbeiten, die Entscheidungen nicht dokumentieren, sind nicht akzeptabel
16. Arbeiten, die keinem Ingenieursprinzip folgen, sind nicht akzeptabel

Zur Organisation

17. Am 14.10. muss die Studienarbeit beim Fachleiter verbindlich angemeldet sein
18. Liegt am 20.12. kein Arbeitsbericht vor, gilt die Arbeit als nicht begonnen
19. Plagiatismus hat 5.0 zur Folge
20. Nicht nachvollziehbare Fristverletzungen (10.3. bzw. 2.6.) haben 5.0 zur Folge

(Prof. Dr. H.J. Müller, 30.09.0)