

How To Write A PPRE Thesis

by

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Master Thesis

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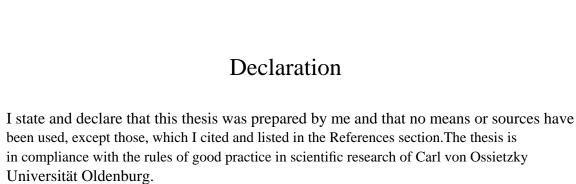
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Abstract

The purpose of this document is to show students of the Postgraduate Programme RENEWABLE ENERGY, how to plan, develop and write a thesis. In order to give them some insight into the process of writing and finally completing the written report about their thesis project – hereafter abbreviated as thesis – all the steps that lead from the idea to the final version of the booklet will be described in short. Readers should have in mind that thesis projects may differ a lot from each other and therefore a general description of the process will never meet all special cases. There will be a number of questions that have to be answered by your supervisor or by the PPRE staff.

This work is dedicated to all friends and colleagues, who have given me the strength and the will to do what I had to do in order to successfully complete this piece of work.	



Oldenburg, 20th of September 2019

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8 1 INTRODUCTION

1 INTRODUCTION

When PPRE¹ students come to Oldenburg some of the newly arrived have already a firm idea of the subject/field of their thesis project they will develop at the end of the programme, although then still an item more than 16-18 months in the future. Well some guys and girls really stick to their first idea, but quite often with time the perception of the options available here in Germany/Europe and especially the impressions from the period of the External Practical Training² will influence the choice of subject, supervisor and finally the selection of the title of the thesis project.

Then, after all these decisions have been made, there comes the moment, when you might want to plan the whole thing, in order to ensure good night's sleep as well as a successful submission of your thesis before the deadline expires.

Of course there is a lot of tips, tricks and advice on the World Wide Web (see e.g. [1]) about how to write at thesis³— in the shelves of the university library (see all 972) you will find very useful literature on the topic. But after all, you will have to find out about the local PPRE format, the ideas of your supervisor and some regulations of this university (see Appendix). The purpose of this short paper, which mocks to be in the correct format of a thesis, is to inform PPRE students about what they have to do, what they can do, and also about what they should never do.

In any case it is useful to read more about thesis writing and to have a look at the structure and layout of thesis booklets in the PPRE library.

¹ PPRE–Postgraduate Programme RENEWABLE ENERGY at Carl von Ossietzky Universität Oldenburg – https://uol.de/en/ppre/

²External Practical Training: a period of two months in an institution or company, where a project on Renewable Energy topics is performed

³ http://www.google.com or any other search engine will give you tons of these pages...

2 FINDING THE RIGHT ENVIRONMENT

A thesis project should not take place as a 'one-person show' – i.e. you are kindly invited to look for a research group, a company or an external institution/body which will guide and support your progress during your thesis period.

2.1 How to find a topic/company/etc.?

When trying to find your specific project you have to

- Make up your mind, what field you are most interested in,
- Check any possible follow-ups from your external training,
- Use opportunities like conferences, exhibitions, industrial fairs and excursions, to establish personal contacts,
- Contact the lecturers of the specialisation you are most interested in usually they have good contacts to institutions and industries or even offer own topics, or
- Ask around in the PPRE-network: alumni, your student colleagues, and talk to PPRE lectureres & staff.

Of course things only work out successfully with some inputs from your side:

- You have to define your fields of interests,
- Look for specific companies/institutions,
- Find a person who might be your possible local supervisor, with whom you discuss and fix a topic and later the title of your project,
- Confirm the topic and precise title with an academic supervisor at the University in Oldenburg (a person who should be lecturing in PPRE), and
- Keep your PPRE tutors well informed about the steps you take and the progress you make.

Like with many issues in the Postgraduate Programme, a good communication style is very helpful with the thesis placement process and makes success more probable and sustainable...⁴

⁴ Please: Do not send mass-e-mails when applying for thesis-places; do not use e-mail addresses like info@...

3 DEFINING YOUR THESIS SUBJECT

In this section some explanations concerning the introduction of a Master Thesis (and principally of every scientific work) is given. The section 'Introduction' should consist of three distinctive parts:

3

- 1. Definition of the main and general research question(s),
- 2. Presentation of the main research goal(s), and
- 3. Detailing concise research questions / hypotheses.

In some cases it may be of advantage to add to the introduction a short overview of chapters/sections that follow.

3.1 Main and General research question(s)

At the very beginning of every scientific work the principal problem, the main and general research question(s) have to be defined. It has to be explained why there is a demand / need for such an investigation / research. In most of the cases this has to be motivated from two sides:

Firstly, it exists a demand to solve (or to start to solve) an open problem. This might be an open question within a complex theory (e.g. in physics: the discovery of the blackbody form and anisotropy of the cosmic microwave background radiation as part of the theory to understand the origin of the universe; Nobel price 2006); but it can also be a very precisely defined problem emerging from the field (e.g. material deterioration in off-shore wind farms — an unresolved issue).

And secondly, it is to prove – through referring to the latest and most relevant scientific literature – that so far there is no other research paper presenting the same results / solutions to the elaborated question.

In short: There is a white spot in science and there is a need / demand to solve a problem. While defining his / her general research question(s), the scientist shows that he / she is familiar with the scientific literature and at the same time he / she is integrating his / her work into a particular area and tradition (scientfic methods) of already existing scientific literature. At the end of the 'Introduction' section it should be clear: what is the state of knowledge in the respective area.

3.2 Main research goal(s)

With the second step the main research goal(s) should be defined. This implies a clear limitation of the planned research project. See also some remarks below on time budget and project management (see section 4.2).

3.3 Concise research questions / hypotheses

Finally, the concise research questions / hypotheses have to be presented. This should be done very carefully and these paragraphs should be readable / understandable and clear.

3.4 Revision of Goals & Questions

This whole introduction part is to be defined (and has to be fixed) at the very beginning of every investigation / research project and thesis. But it has to be revised / reorganised / corrected / adapted during the whole research process. Here the advantage of keeping a daily updated research diary comes into the picture. And this paragraph has to be finalised after the whole research project is closed. In short: This section is situated in the first pages and has to be written at the very beginning, its review accompanies the whole research process and it is the last thing to be finalised.

There is no restriction concerning its length. But, as a rule of thumb, the introduction should have a minimum of two and a maximum of eight pages.

4 RUNNING YOUR THESIS PROJECT

4.1 Adapting to 'local rules & regulations'

Many of you will join a company, a research institute, a research group at a university, or some other institution in order to perform the thesis project. It is essential to inform yourself about the 'local rules & regulations', which may include a lot of practical things. It is nice, if the 'local people' can provide some written statement about their regulations. Also the university finds it is good practise to write down and sign a working contract.

4.2 Planning and Time-Keeping

Running a project requires a few things that should be inspected before you speed up into high gear and run into the danger of getting lost in time and space. A person involved in PPRE since its beginning tries to put it the following way:

Time is a non-renewable resource. Some people in our programme try hard to find out about this basic fact...[3]

So, thinking about this, you will find that time in the case of the PPRE thesis project is one of most limiting factors for your work - i.e. if you had more time, you would achieve more.

Thus it seems to be wise,

1. to begin your work with an exposé, which lays down ideas, goals, methods, resources and a schedule of work,

- 2. to economise on the use of time,
- 3. in order to do so, keep track of the use of time, and
- 4. compare the progress of your work with a schedule, which you have made in the beginning and which has to be updated continuously.⁵

It must not be critical-path software, it can be just pen and paper or a simple calendar, in order to keep track of your time.

4.3 Logging Not Only Data — The Project Diary

A private diary (in whatever form –e.g. file, notebook, audio-recorder) helps a lot to become organised and to remain organised in periods of stress and doubt. When you keep your daily log (like a ship's master) you will find it much easier to steer a keen course without going in circles.

Again we want to stress the fact, that investing time in this activity of keeping a diary will pay off by winning time in situations, where otherwise (without diary notes) you would spend hours and hours on retrieving notes or rethinking undocumented decisions.

4.4 Never Walk Alone

In a time of concentration on your special topic you might run into periods of isolation – therefore it is advisable to talk not only with your supervisor(s) or your co-workers (in an external institution/company) but to have a good and intensive communication with friends. Talking helps to find solutions, even when the other party cannot give specific advice ...

⁵ Well, some people try to save time by saving the time for planning and scheduling. In the authors' opinion this is the inroad to nervous break-down.

5 FORMAT OF FINAL COPY OF THESIS

The one bound copies you will have to submit has to obey a flexible but fixed standard⁶, which will be explained in this section step by step.

5.1 Sectioning of the Thesis Booklet

The exact way of making the sectioning of your thesis is a subject between you and your supervisor and will of course depend on the topic/field of the thesis project. Some items should not be missing:

- Titlepage have a look in last years' theses in the PPRE library⁷
- Table of Contents (see the table of contents of this document on page 6)
- Abstract less than one page (the very last thing to write, but the first in the text)
- Introduction second last thing to re-write (before abstract see also page 10)
- Chapters/Sections, Subsections as agreed with your supervisor
- Do not forget Conclusions, Summary, Outlook
- References either alphabetical with respect to the name of the first author, or just numbered with respect to occurrence of citation in the text.
- Acknowledgements which some people also place together with a dedication after the titlepage (all this is optional)
- Bio-Data (CV) this can be a short version: mainly educational and professional experience (max. one page)
- Declaration –a statement with signature that the thesis was prepared by the author and only means and sources that have been cited were used (See page 5)
- Appendices there you place all data, tables, graphs that are useful but not absolutely necessary AND would be distracting the reader when situated in the body of your text. Of course, it is usefull and often necessary to cross-reference items in the Appendices within the main body of the text.
- Details have to be discussed with your supervisor.

⁶In order to see examples glimpse and browse last years' theses in the PPRE library

⁷ If individual agreement is achieved the titlepage with all relevant Data can be obtained from the staff – ready for binding

5.2 Format/Layout of the Thesis

The thesis booklet will be in A4 format, two-sided printing is possible. Margins should be (at minimum):

- Left margin (inner side next to binding): 3.5cm
- Right margin (outer side away from binding): 2.5 cm
- Top and bottom margins: 2.5 cm

The standard typeface should be Times Roman, 12pt. Sections, subsections are in bold and at moderately increased size – take this document as an example. The baselineskip (the line spaceing) should be like in normal documents.

There are several ways to put page numbers on the page – the most common one is to have the numbers in the centre of the foot of the page. In this document (with headings), you find the page number on the outside edge of the page heading. Page numbers are indispensible!!

And you might find it good to start a new section or chapter on a fresh page (not subsections, of course!). It is your choice if you indicate the beginning of a new paragraph by indenting the first line a few centimetres – or by leaving a parskip (like in this document).

5.3 Figures and Tables

Some students find it very difficult to put graphical or table material into their thesis. But if you obey some simple rules, things will work out easily. It is required to number figures (see fig. 1) and make cross-references by using the number of the figure. In contrast to this short document, it may be advisable in a real thesis, to number figure section-wise: Figure 3.1, e.g. would be the first figure in Section 3. The choice you make on what word processing software to use for the writing of your thesis may play a role in getting this job done, so be sure to consider this when selecting your software.

Lists of figures & tables are desirable features and should appear after the table of contents.

A table should bear its caption on top (a figure on bottom) and has to be numbered like the figures – see an example in tab. 1. Again a list of tables is a desirable feature.

Captions have to be self-explaining: they should be readable/understandable and help to find the right figure or table if you browsing the thesis document.

REGION	No.	%
Asia	85	36
Africa	66	30
Latin Am.	33	14
Germany	30	13
Europe w/o G.	14	6
Other	3	1

Table 1: Example of a table (Source: [5])

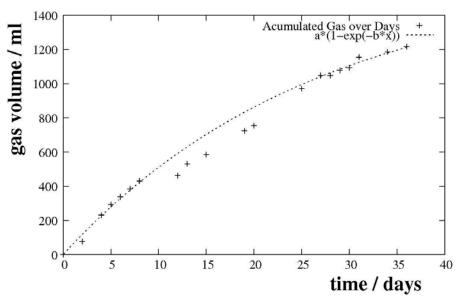


Figure 1: Example of a figure: Biogas batch reactor — experimental results (Source: [9])



Figure 2: Solar Lunch during PPRE Summer Lab (Source: [3])

5.4 References

There are numerous ways and styles for citing literature. For the thesis work in PPRE two styles seem to work out nicely. One way is as done in this paper (just have look at the REFERENCES at the end and the citations like [5] in the body of this text). The disadvantage of this enumerated citation style is that you have lot of work, if your word processor system does not provide automatic sorting and referencing⁸.

5

A very good alternative to this way is the alphabetical sorting. You may keep all your references in a separate file like this:

- 1. Blum, K. (1991), personal communication.
- 2. Comer, D.E. (2003) http://www.cs.purdue.edu/homes/dec/essay.dissertation.html
- 3. Shoaff, W.D. (2002), How to Write a Master's Thesis, http://www.cs.fit.edu/wds/guides/howto/,

Now, in the body of your text a citation can look like [BLUM (1991)] or [SHOAFF (2002)].

The advantage of this citation method (with manual operation) is its ease of maintenance as sorting within the alphabet is no difficult thing. Also the entering of entries in the last minute makes no real trouble – this contrasts sharply to the enumerated system, where last minute entries will bring headache and/or unpleasant numbering sequences. So your decision should be based on practical and not on aesthetic considerations.

 $^{^8\,}Well\ the\ system\ used\ to\ produce\ THIS\ PAPER\ does-please\ see\ http://www.lyx.org/WhatIsLyX$

PUBLICATION OF THESIS PROJECT IN OPEN ACCESS LIBRARY, UNIVERSITY OF OLDENBURG

If you are interested, your thesis might be published in the local Open Access Library http://oops.uni-oldenburg.de/>.

To do so, your 1st examiner at Uni Oldenburg (Prof.) needs to positively assess your thesis on the form proided at <<u>http://oops.uni-oldenburg.de/</u>>

Contact:

Kim Braun Mediendienste/Digitale Bibliothek Bibliotheks- und Informationssystem der Carl von Ossietzky Universität Oldenburg Uhlhornsweg 49-55 26129 Oldenburg

Tel.: 49 441 798-4025

Mail: kim.braun@uni-oldenburg.de

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[1] Comer, D.E., (2003), How to write a dissertation, Computer Science Department, Purdue University, West Lafayette, Indiana http://www.cs.purdue.edu/homes/dec/essay.dissertation.html (last visited on 2010/07/09)

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- [9] Knecht, R., (2014), Lab experiments on Biogas, personal communication

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APPENDICES

Appendix A — Measurements

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Table 2: Table: Measurement results

Appendix B — Excerpt from PPRE Exam Regulations

§ 20 Admission to the Master Thesis

- (1) To the Master thesis will be admitted, who has been registered at the Carl von Ossietzky University Oldenburg in the corresponding study course and who can prove by successful completion of modules of at least 60 CP the knowledge necessary to write the Master thesis. The respective attachments may contain different regulations.
- (2) The following documents have to be added to the application for registration to the Master thesis:
- a) a proposal for two examiners
- b) a proposal of the first examiner for the subject of the thesis
- c) an explanation about whether a Master's examination or parts of such an examination in the same field of study at a university or equal college in the Federal Republic of Germany or at a European university were finally not passed or whether the student takes place in a current examination procedure.
- (3) The board of examiners decides on the registration. The registration is refused, if
- 1. the registration requirements are not fulfilled or
- 2. the documents are incomplete or
- 3. another examination was finally not passed in the field of study in the same study course at a university or equal college in the Federal Republic of Germany or at a European university.

§ 21 Final Master Module

- (1) The Master thesis should prove that the student is able to work independently on a problem of the chosen field after scientific methods within a given period. Subject and problem definition of the Master thesis should correspond to the examination purpose (§ 4 clause 1) and the time line according to clause 5. The type of assignment and the problem definition have to be stated with the specification of the subject. The subject can be returned only once and only within the first two months of the processing time.
- (2) The subject of the thesis can be determined by any member of the professoral and junior professoral staff of the Faculty for Mathematics and Natural Sciences taking part in the respective Master course. With approval of the board of examiners the subject can be worked out by other examination-authorized persons after § 7 clause 1; in this case, the second examiner must be a member of the junior/professoral staff involved in teaching within the Master's programme of the Faculty of Mathematics and Natural Sciences of the University of Oldenburg.
- (3) The subject is fixed by the first examiner after having heard the student. Upon request, the board of examiners provides for the fact that the student receives a subject on time. The chairperson of the board of examiners gives out the subject; expenditure is to be made on record. With the expenditure of the subject become the examiner who worked out the subject (first examiner), and the second examiner are appointed. During the editing of the Master thesis, students are supervised by the first examiner. If the Master thesis is to be completed at an institution outside the university and is supervised or examined by an external examiner of that institution, it is necessary to obtain the approval of the board of examiners.
- (4) Upon request of the candidate the Master thesis can be written in English. A composition of the Master thesis in another language is possible, upon request, if both examiners agree.
- (5) The expenditure of time for editing the Master thesis corresponds to the number of the credit points (30 credit points) thereof 27 credit points for the Master thesis and 3 credit points for the final colloquium unless different regulations are stated in the study course related attachments. As a rule, the period from the hand out of the subject up to delivery of the

Master thesis amounts to six months. In particular cases, the board of examiners can extend the editing time on reasonable application for two more months.

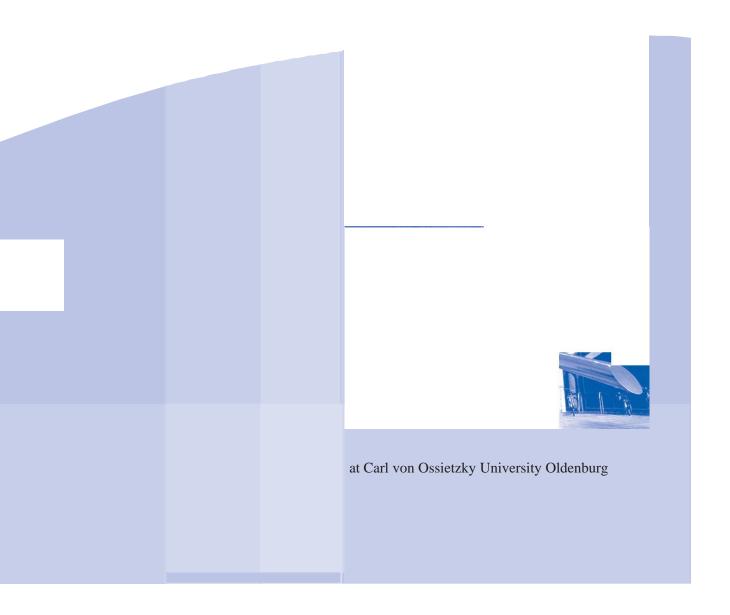
- (6) With the delivery of the Master thesis, students have to assure in writing that she or he wrote the thesis independently and used none than the stated sources and accessories and that the guidelines on good scientific practice and publications were observed as stated in the guidelines on good scientific practice of the Carl von Ossietzky University Oldenburg.
- (7) The Master thesis is to be delivered within the given time limit at the examination office. The time of delivery has to be recorded.
- (8) As a rule, the thesis has to be assessed within eight weeks after its delivery by both examiners.
- (9) In the university-public oral colloquium the student has to introduce the results of the Master thesis and to prove that she or he is able to edit interdisciplinary and problem-oriented questions from the respective field of study on a scientific basis, independently and and that he or she is able to display these findings in a comprehensible way.
- (10) As a rule, the final colloquium is to be held when the Master thesis is completed under the supervison of the examiners and must not be longer than 60 minutes.
- (11) The overall grade for the thesis is obtained by both parts of the module and is weighted according to the credit points (for PPRE 66,6 % Master thesis, 33,3 % final colloquium)

§ 22 Repetition of the Master Thesis

- (1) If the Master thesis has been evaluated as "not passed" or stated as not "passed" it can be repeated once. A second repetition is excluded. A return of the subject at the repetition of the Master thesis is only allowed if the subject of the first thesis has not been returned.
- (2) The new subject of the Master thesis will be handed out within an adequate period



GOOD SCIENTIFIC PRACTICE



Dear students,

You are now beginning your university education. In the course of your studies, you will become acquainted with science on many levels. At first, you will attend academic lectures and seminars, and before long, you will yourselves be reporting on scientific or scholarly issues. Sooner or later you will have to apply the principles of academic work yourselves, which may happen during one of your classes, during the work on your final thesis, or while collaborating on a research project. You will experience the fascination and excitement of exploring correlations and discovering new insights and truths, no matter what field you work in. Whatever academic subject you study, it will have its own appeal, its special challenges, and often its particular scientific practice.

The Carl von Ossietzky University Oldenburg has committed itself to the implementation of good scientific practice. In this respect the university feels especially responsible for its students and the next generation of scholars. Strict adherence to the general and specific principles of academic work should be communicated to you, but also exemplified to you and demanded of you.

"Honesty and truth have the highest priority in academic work"2, in short: academic integrity. However, a constant critical approach to your scientific findings, and openness to critique from your peers and the research community are also very important.

Further principles of good scientific practice will be described here. At the same time, we must draw your attention to the not infrequent infringements, which can have substantial consequences (see below). Always consider: notes, protocols, and experimental data must be documented truthfully, completely, and in their unaltered form. Results must always be verifiable, and theoretical deductions must be comprehensible. This includes keeping all documents, original data (e.g. from practical experiments) and research materials. It must be possible, and when necessary permission must be granted, to look into the procedures, so that it is clear how the results were obtained, or how a final paper was elaborated (e.g. seminar paper, results protocol).

 $http://www.uni-oldenburg.de/uni/amtliche_mitteilungen/dateien/AM2002-04_Leitlin.pdf$

¹ Guidelines for good scientific practice at Carl von Ossietzky University (30.9.2002, in German).

Exact statement of your sources, as well as clear indication of citations, are indispensable to making your findings verifiable. Taking passages or ideas from unnamed sources is plagiarism (theft of intellectual property).

The availability of texts, pictures, etc. on the internet poses an increasing temptation to infringe copyrights by borrowing material for seminar assignments, presentations, and examination papers. If teachers discover material without clearly cited sources (for example using a plagiarism search engine), they are required to take measures which may include exclusion from examinations - even from examinations that are prerequisite for graduation -but at the very least deny recognition of completed work or withhold credit. Plagiarism in science is a form of academic misconduct. Further forms of academic misconduct include sabotage and unauthorized disclosure of results. Any suspicion of academic misconduct at the University of Oldenburg will be thoroughly investigated according to the rules of procedure.3 Proven misconduct will result in appropriate legal consequences.4

Accuracy in authorship also applies to independently written practical reports. Protocols or other assignments prepared by a group (even a group of two) must be marked as group work and may not be presented as the work of an individual. Concealment of data or supporting documents is also a violation of good scientific practice. Finally, giving false information on an application, for example for a scholarship, is also academic misconduct.

As a member of a university, you know that academic work is indispensable for maintaining and developing the cultural and social foundations of our society. Academic work strives to make new discoveries, and at the same time, maintain the respect and recognition of the public. Contribute confidently and actively to the realization of good scientific practice in the course of your studies and throughout your life. Don't allow yourself to be diverted from your path of academic integrity by others including bad examples that occasionally make head-lines.

http://www.uni-oldenburg.de/uni/amtliche_mitteilungen/dateien/AM2000-01_Ordwissf.pdf

³ Procedure in case of suspicion of scientific misconduct - procedural rule (26.1.2000, in German).

⁴ Procedural rule, Annex.

If you have questions or doubts, or if you ever observe something that is not consistent with these principles, you can always speak confidentially with a representative of the Humanities5 or Natural Sciences6 or a member of the Commission for Ethics and Assessment of Research Effects at the University. The commission includes representatives of all groups of university members, including students.7

Heinhord Alina

Prof. Dr. Meinhard Simon Chairman of the Commission for Ethics and Assessment of Research Effects



5 Confidential persons of the Humanities:

6 Confidential persons of the Natural Sciences:

7 Commission für Ethics and Assessment of Research Effects.

Prof. Dr. Sabine Doering (Germanics), Faculty III

Prof. Dr. Gerd Hentschel (Linguistics), Faculty III

Prof. Dr. Axel Brehm (Chemistry), Faculty V

Prof. Dr. Michael Langenbruch (Mathematics), Faculty V

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