



**UNIVERSITÄT
PADERBORN**



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COMPUTER SCIENCE

MASTER PROGRAM

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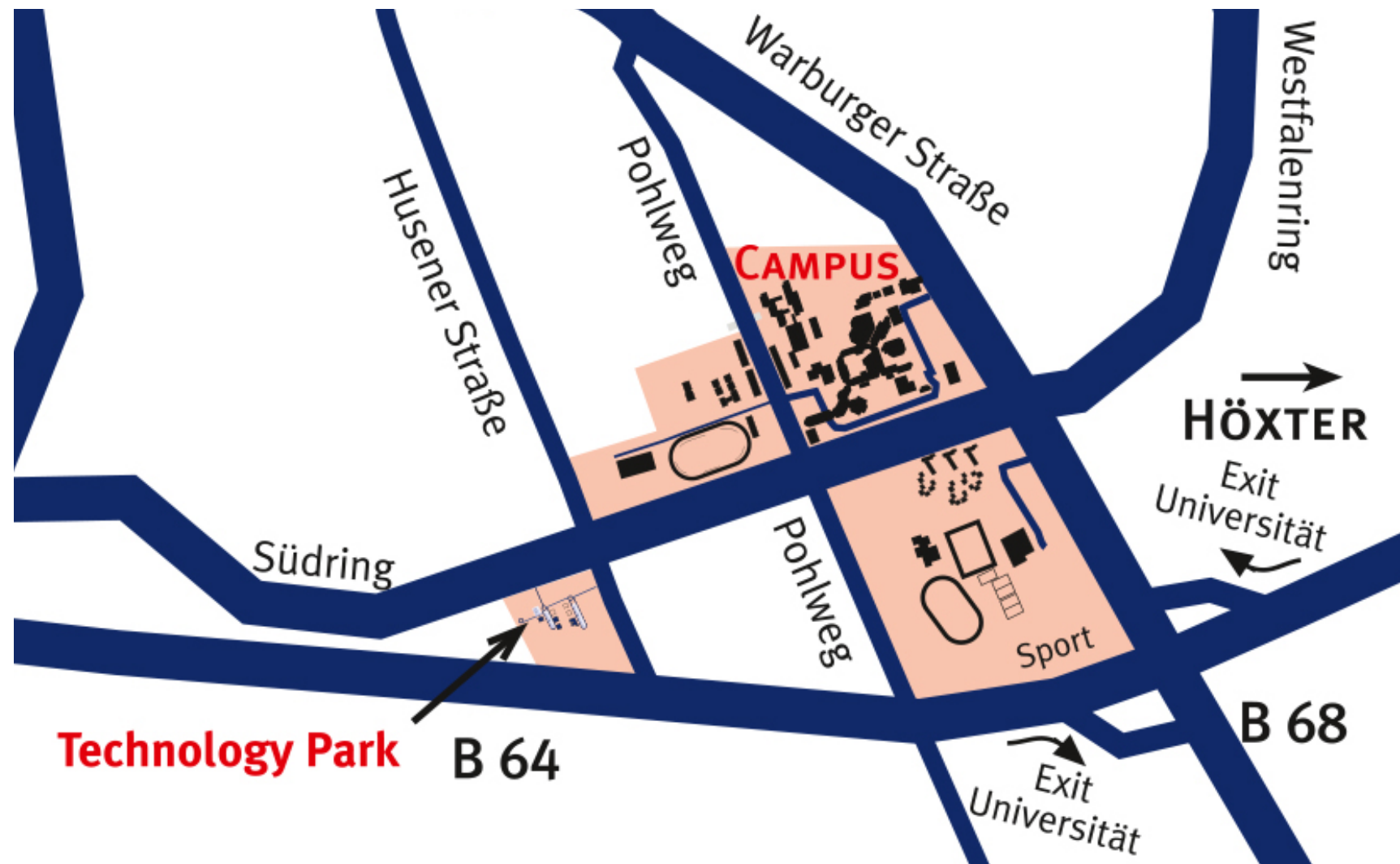
Web: <https://cs.uni-paderborn.de/en/studies/advice-and-support/academic-advising/>

Twitter: [@Study_CS_UPB](https://twitter.com/Study_CS_UPB)

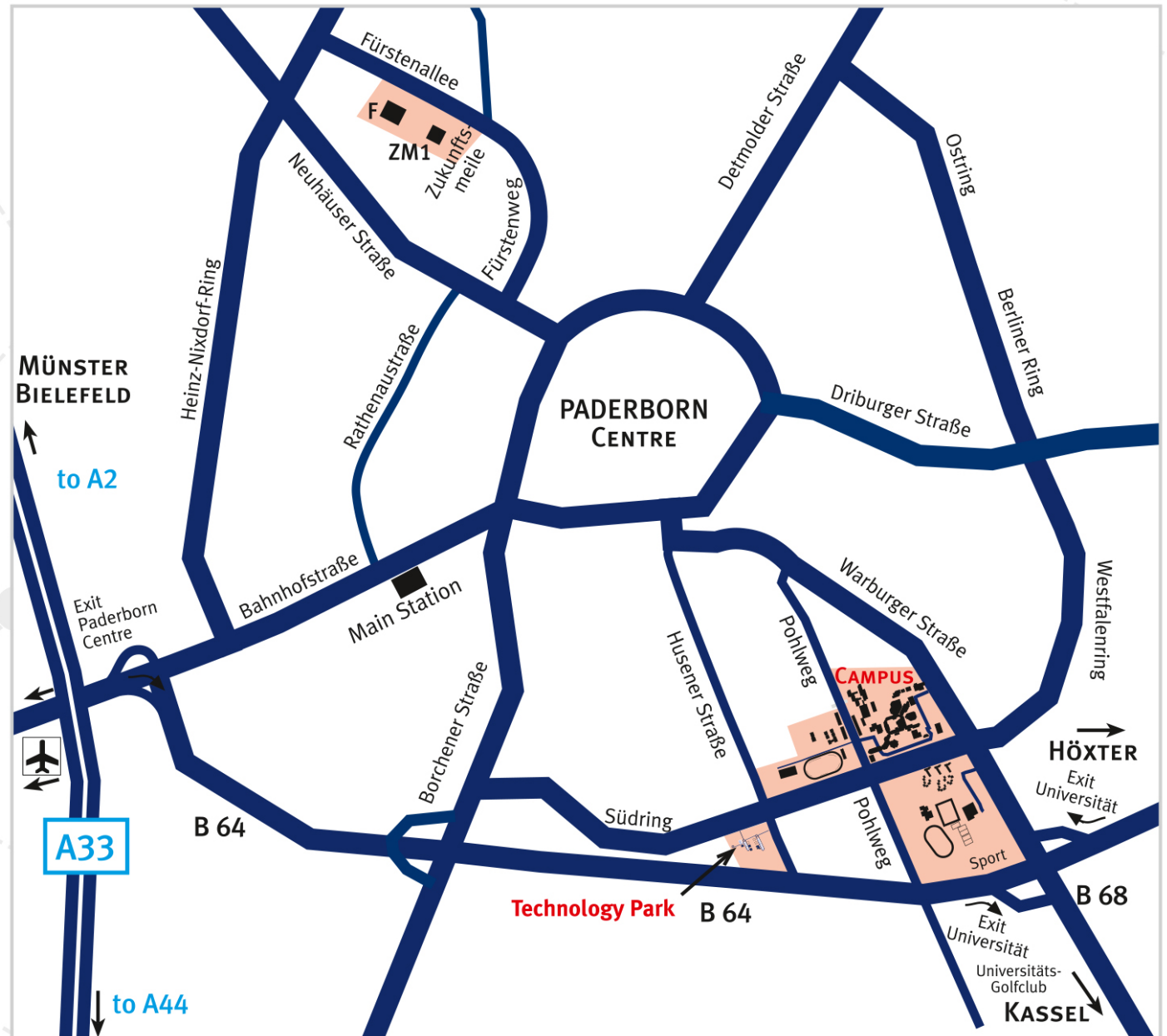
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Where are we?



Where are we?



Outline

- Prerequisites
- Elements of the Master Degree Program
- Structure of the Program
- Scope and Schedule
- Examinations

Prerequisites of the Master Program

What you learnt in your Bachelor program ...

- in India, Syria, Egypt, Pakistan, ...

... must match (roughly) what Paderborn students learn in their Bachelor Degree studies.

- The teaching goals of the Paderborn Bachelor Degree Program match the necessary prerequisites.
 - mostly done in German
 - content organization comparable to Master program
 - same teaching staff

Bachelor and Master are designed as a consecutive study program.



Prerequisites of the Master Program

Most important check has already been done before admission!

- We want you to succeed!

- Self-assessment:

<https://cs.uni-paderborn.de/en/studies/getting-started/information-for-international-students/>

Bachelor Degree Program in Paderborn

1	Programming Programming Languages	Modelling		Calculus for Computer Science	Minor Subject and Extracurricular Studies
2	Software Engineering Database Systems	Data Structures and Algorithms	Digital Design	Linear Algebra for Computer Science	
3	Software Engineering Project	Computability and Complexity	Computer Architecture	Stochastic for Computer Science	
4	Designing User Interfaces	Module from Algorithms and Complexity	System Software and System Level Programming		
5	Module from Software Engineering	IT Security	Module from Computer Systems	Proseminar Mentoring	
6	Module from Data and Knowledge	Specialization Module	Bachelor's Thesis		

On a more abstract level

Ability to apply foundations of Computer Science

- usage of formal calculi to specify problems, structures, systems, languages, ...
- formal methods to analyze algorithms
- formal methods to check solutions
- proving properties of algorithms (correctness, performance, ...)

Experience in doing practical work

- application of methods and tools for software design and implementation
- solid background in object-oriented concepts
- substantial experience in at least one programming language
- ability to switch to a new programming language within a short time



There's more to it!

Ability to do scientific work

- searching for and investigating scientific publications
- writing scientific documents
 - adequate structure, clear descriptions and explanations, citations and references, correct English
- developing and giving presentations
- Check the self-assessments for courses before choosing them:
<https://cs.uni-paderborn.de/en/studies/getting-started/information-for-international-students/self-assessment-tests-for-master-lectures/>

Elements of the Master Program

- Lectures with Exercises/Tutorials – modules of 6 credits each
- Seminar – 5 credits each
- Project Group – 20 credits over one year
- Thesis – 30 credits
- Minor subject, general studies or German Language Course – 12 credits
- All done in English – except the last one ...
- You always need to register for these elements as well as the exams plus sometimes additional things!
- Always – ALWAYS! – visit the first lecture in a semester where all necessary information about the course will be given!

Master Degree Program in Paderborn (Example)

1	Module I	Module II	Module III	Module IV	Module V
2	Project Group	Module VI		Seminar I	Extracurricular Studies
3		Module VII	Module VIII	Seminar II	
4	Master's Thesis				

Study Structure

Six Focus Areas

- Software Engineering
- Algorithm Design
- Networks and Communication
- Computer Systems
- Intelligence and Data
- Data Science

Every student has to choose one of these areas as specialization area when applying for a master's thesis. Plan ahead!

Modules

Every module has 6 ECTS points

- belongs to one or more focus areas (of the six).
- consists of exactly one class (from that focus area).
- is described in the module handbook (Modulhandbuch).

Every student has to

- study three modules in the area of specialization,
- study one module in some other focus area,
- study four more modules in whatever area they like.
- Hence every student has to take 8 modules overall.

Master Degree Program in Paderborn (Example I)

1	Advanced Computer Architecture (Computer Systems)	Cooperative Mobile Systems (N&C)	Interactive Data Visualization (Data Science)	Build It, Break It, Fix It (SE)	Machine Learning I (I&D)
2	Project Group	Future Internet (N&C)		Seminar I	Extracurricular Studies
3		Networked Embedded Systems (N&C)	Public-Key Cryptography (Algorithm Design)	Seminar II	
4	Master's Thesis				

Master Degree Program in Paderborn (Example II)

1	Advanced Distributed Algorithms (N&C)	Cooperative Mobile Systems (N&C)	Mobile Communications (N&C)	Vehicular Networking (N&C)	Advanced Computer Architecture (Computer Systems)
2	Project Group	Future Internet (N&C)		Seminar I	Extracurricular Studies
3		Networked Embedded Systems (N&C)	Routing and Data Management in Networks (N&C)	Seminar II	
4	Master's Thesis				

Master Degree Program in Paderborn (Example III)

1	Advanced Distributed Algorithms (N&C)	Cooperative Mobile Systems (N&C)	High-Performance Computing (Computer Systems)	Intelligence in Embedded Systems (Computer Systems)	Advanced Computer Architecture (Computer Systems)
2	Project Group	Future Internet (N&C)		Seminar I	Extracurricular Studies
3		Networked Embedded Systems (N&C)	VLSI Testing (Computer Systems)	Seminar II	
4	Master's Thesis				



Seminars are special

- Count for 5 ECTS points
- 2 meeting hours per week or compact on two to three days
- Teacher proposes topics (Seminarthemen)
- Every student selects one topic to work on and then
 - prepares a talk with slides (Seminarvortrag)
 - submits a written elaboration (Ausarbeitung)
- You need to work scientifically and be aware of good practices and the problem of plagiarizing in particular!
- Seminars do not belong to specific focus areas. You are free to choose.
- <https://cs.uni-paderborn.de/en/studies/study-elements/seminars-of-computer-science/>

Project Groups are even more special

- Workload: 20 ECTS points in one year – including semester breaks
- Presentation of all project groups in a public event (Projektgruppenvorstellung) in the last week of teaching season – you should participate to find a group that suits you.
- Interested students apply for a project group and 8 to 16 students are accepted.
 - Ranking by you as well as by the lecturers.
- Working for two semesters on a project
(often: concept and implementation of some software)



Project Groups are even more special

- Highly self-organized
- You have to contribute actively!
- All our project groups are in English!
- Project groups do not belong to specific focus areas. You can apply to any one.
- All details at <https://cs.uni-paderborn.de/en/studies/study-elements/project-groups/>

Master's Thesis (Masterarbeit)

- Workload: Full-time for one semester (30 ECTS)
- What has to be done?
 - Literature review
 - Research: develop new results!
 - Obey rules of good scientific practice!
 - Often: implementation of some software
 - Writing a thesis (~ 80-120 pages) on scientific level
 - All of this: within 6 months (formally checked!)
- First a planning phase (typically 1 month)
- Then the real work (5 months)

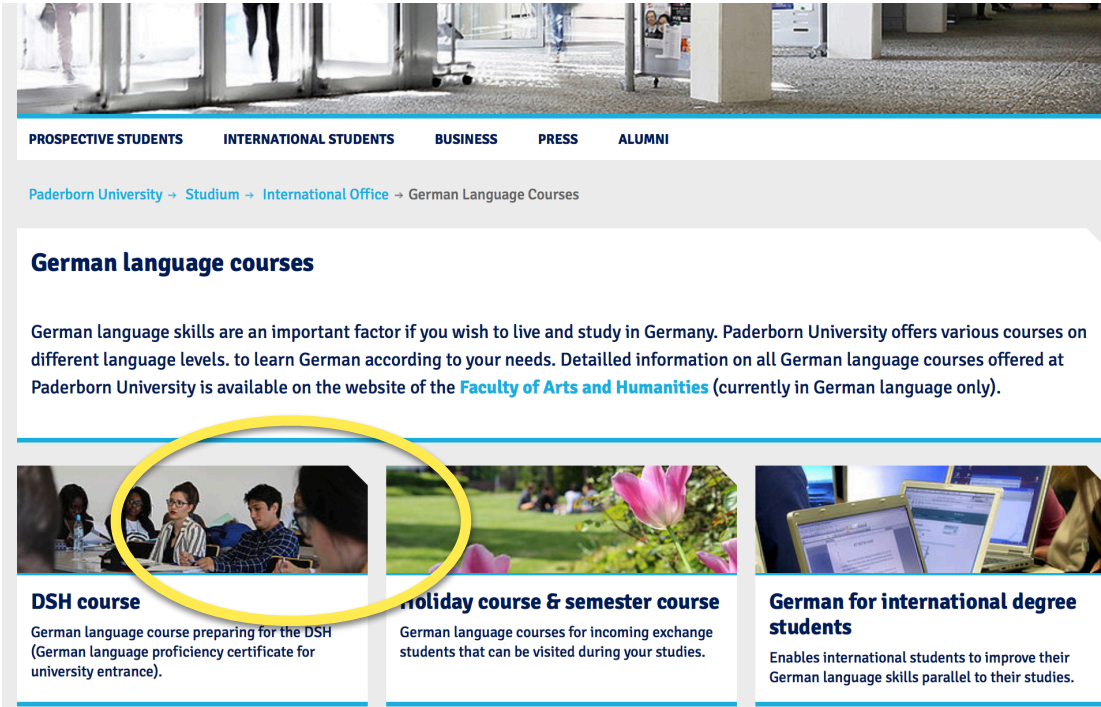
Master's Thesis (Masterarbeit)

- Finding an advisor (Betreuer)
 - talk to professors working in an area that interests you
 - talk to the organizer of your project group
 - ask friends
- Finding a topic (Thema) is an interactive process between student and advisor
 - own ideas?
 - project group topic?
 - discussion with the (potential) advisor!
- The Master's thesis defines your area of specialization – where you need to have three modules completed before you can register the thesis.



German Language Course (Deutschkurs)

- No Master's degree without German Level A2!
- Language Courses hosted by the International Office
- Typically covers the „General Studies“ part (12 ECTS)
- Check <https://www.uni-paderborn.de/en/studium/international-office/deutschkurse/>



The screenshot shows the website of Paderborn University's International Office. The navigation bar includes links for Prospective Students, International Students, Business, Press, and Alumni. The breadcrumb trail reads: Paderborn University → Studium → International Office → German Language Courses. The main heading is "German language courses". Below it, a paragraph states: "German language skills are an important factor if you wish to live and study in Germany. Paderborn University offers various courses on different language levels, to learn German according to your needs. Detailed information on all German language courses offered at Paderborn University is available on the website of the Faculty of Arts and Humanities (currently in German language only)." At the bottom, there are three course options: "DSH course" (German language course preparing for the DSH), "Holiday course & semester course" (German language courses for incoming exchange students), and "German for international degree students" (Enables international students to improve their German language skills parallel to their studies).

PROSPECTIVE STUDENTS **INTERNATIONAL STUDENTS** **BUSINESS** **PRESS** **ALUMNI**

Paderborn University → Studium → International Office → German Language Courses

German language courses

German language skills are an important factor if you wish to live and study in Germany. Paderborn University offers various courses on different language levels, to learn German according to your needs. Detailed information on all German language courses offered at Paderborn University is available on the website of the [Faculty of Arts and Humanities](#) (currently in German language only).

DSH course

German language course preparing for the DSH (German language proficiency certificate for university entrance).

Holiday course & semester course

German language courses for incoming exchange students that can be visited during your studies.

German for international degree students

Enables international students to improve their German language skills parallel to their studies.

What you need to do to get your degree

Every student has to...	ECTS credits
... take three modules from the area of specialization	18
... take one module in one other area	6
... take four modules in whatever area	24
... take two seminar modules	10
... take part in a project group	20
... write a Master's thesis (must be from your specialization area)	30
... take minor subject, do general studies or take the German language courses	12
Adding up to	120

It is your own responsibility to meet these criteria!

Examinations: Normal modules

- Oral or written exam about the class
- Oral exams: individual date with the teacher
- Written exams: usually two dates offered in the semester breaks
- Class may include written homework or project work as pre-requisite
- You need to register for the exams!
 - All with PAUL – see next presentation
 - First exam period: 21st of October to 21st of November 2019
 - Second exam period: 2nd of March to 6th of March 2020
- De-register if you don't want to take an exam! Otherwise you might be stuck with that module.

Examinations: Other types

- Seminar
 - Evaluation of presentation and seminar paper
- Project group
 - Permanent evaluation throughout the project
- Master's Thesis
 - Evaluation by the advisor and a co-advisor
- Language Course
 - Language certificate after the course

Examinations: Repetition

- Module exams can be repeated twice.
- Seminars can be repeated twice.
- Project group can be repeated twice (you really don't want that!).
- Master's Thesis can be repeated once.
- German Language Course can be repeated until the end of days.

Examinations: Compensation

There are (limited) ways

- to shift aside („compensate“) exam failures
 - e.g. failure in one module
 - give up on that one and try another one instead
- to improve exam results
 - e.g. you succeeded in a module exam but with an unsatisfactory result, you can try a different module additionally.

Final failure is possible! If ...

You have no more option to use compensation and you are no more able to fulfill the requirements:

- 3 modules in the specialization area
- 5 more modules with at least one of them in another area

OR

- three attempts for a project group failed

OR

- one seminar failed three times

OR

- two attempts for a Master's thesis failed

Common pitfalls

- Deadlines are important. Some things can be amended if you miss a deadline, some can't or may result in delays of up to a year!
- You need to register for all sorts of things. Do it – and mind the deadlines!
- If you don't want to finish a course, de-register it and everything associated with it – and mind the deadlines. Otherwise you may be blocked from taking other courses as there is an upper limit of courses you can take.
- Pay your semester fees as early as possible. Otherwise you might not be able to participate in the project group distribution – which will result in a delay of one semester at least.
- Never miss the first meeting of a course.

Some more important things

- PAUL is your friend
 - Most important information is sent via the PAUL system or is shown there when you log in.
 - Check your university email address regularly!
- Many courses use the PANDA system for information and course material.
- Watch out for the project group presentation and attend it!
- Follow us on Twitter (or at least bookmark us in your browser and check regularly) – we will remind you of important deadlines.
 - @CompScience_UPB, @Study_CS_UPB

Schedule

- You choose!
 - Which specialization area? One out of six.
 - Which modules with regular classes? Almost complete freedom!
 - Which project group? Each semester enough new project groups start so that every student who wants to participate can do so.
 - Which Master's thesis? Unlimited choice, but must be from your specialization area.

Schedule

- Consider workload!
 - 30 ECTS points is the officially recommended average workload per term.
 - The first semester is tough! (for all the other reasons)
- For your first semester:
 - Choose classes along your interests.
 - It is a good idea to plan for the specialization, but you don't have to stick with your choice.
 - You can not make any mistake as far as the area rules are concerned.

Welcome in Paderborn!

