

tOUr de Bonn



Master Orientation Unit

Orientation Unit for Master Computer Science & Master Cyber Security

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University of Bonn - Student Body & Program Management Computer Science

Welcome to the University of
Bonn

Welcome

- Welcome to the University of Bonn
- We hope you arrived here fine
- Before anything **there is no need to panic**
- You will get all the important information on what your study here entails within this unit
- If you didn't sign up for lectures yet: In Bonn we don't do that before the semester starts, you didn't miss anything

- In addition to the orientation unit the student body produces the Master Inform
 - Magazine for new master students with all the important information
 - PDF can be found on the website of the student body
 - <https://www.fachschaft.info/en/studienbeginn/master-inform/>
 - You can also find it in your master bags

Some more notes

- The slides will be shared afterwards
 - ⇒ You don't have to write everything down

What happens today

10:00	Introductions
~10:30	Your Course of Study
~11:45	Get-to-know games
~ 12:30	Lunch Break with Campus Tour
~14:00	Exam Regulations & The Institute
~15:00	Time to chat
~15:30	Online Services & Student Support
~ 16:30	End of Presentations
~ 18:00	Game Night

(The timestamps in this schedule are just estimates)

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Important Buerocratic Steps

- New to Bonn? → Register at the City Hall ([see here](#))
- New to Germany?
 - You need your city registration (Meldebescheinigung) to open a bank account — appointments fill up quickly, so check daily.
 - After opening a bank account, you can set up your **health insurance** — follow your provider's instructions.
- Enroll at the Studierendensekretariat with your admission letter (if you haven't already, you do this via the application website ([link](#)))
- Activate your Uni-ID ([an explanation is here](#))
 - Set up your uni mail ([the web mail portal](#) and [information on it](#))
 - Check this regularly, possibly set it up in Thunderbird or similar
 - Create your informatics account ([an explanation how to](#))

The Student Body

What is the Student Body

- Students in Computer Science and Cyber Security are organised in the Student Body Computer Science
 - Represents interests of students in Bachelor & Master Computer Science & Cyber Security and Master Life Science Informatics
 - Represents student interests to the university
 - Host memory protocols of old exams
 - Helps students with a variety of problems
 - Sometimes organise events
 - Summer Festival of Computer Science
 - Bachelor & Master OU
 - Game nights
 - And many more

How does the Student Body work

- All students in Bachelor & Master Computer Science & Cyber Security, the Master Life Science Informatics & PHD-Students form the Student Body Computer Science belong to the student body
- Recieves Money from the central Student Body of the University
 - The money you send the uni exclusively goes to the central student body
- There are big student body elections every year
 - Around the start of the summer semester
- Student Body Meetings are usually Wednesday starting at 6 and are open to all students

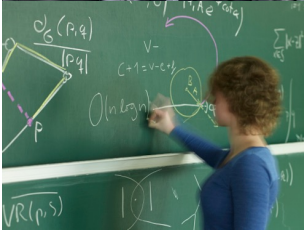
How can the student body help me?

- If you have questions regarding your study, ask the student body
 - Send a mail to **fs@fachschaft.info**
 - Visit the Student Body Office in room 0.019 next to the foyer
 - We can't always help, but usually at least know who can
- We host useful information on our website: <https://www.fachschaft.info/>
 - Memory protocols of old exams <https://altklausuren.fachschaft.info/>
 - The Master-Inform-Magazine
<https://www.fachschaft.info/en/studienbeginn/master-inform/>

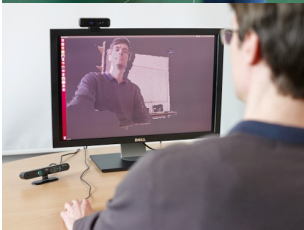
International Office

- The International Office offers help to international students
- Help with organisational stuff (things that are not exclusive to CompSci)
- Good starting point for help in cases that are not related to computer science
- They have programmes to help integrate into a new country & culture
- They offer German courses
 - Language courses do not count towards your master
 - **Opening deadline: October 13, 2025 (from 10:30 am)** — enrollment is competitive and first-come, first-served
- And a lot more (check out [their website](#))

Programme Management



Introductory Meeting for Students of the Institute of Computer Science (Winter Semester 2024)



Your degree programme managers

Herman Haverkort



Michael Nüsken



Bachelor-Master-office

Organisational/Administrative
questions:

servicebuero@
informatik.uni-bonn.de
Mon 11⁰⁰-12³⁰ room 0.022

<https://www.informatik.uni-bonn.de/en/studies/>
<https://www.informatik.uni-bonn.de/en/studies/information-for-first-semester-students>

Course of Study

- Differ by quite a lot between Cyber Security and Computer Science
- Indicator which master something applies to will be in title
- Both share that the majority of the master consists of choosing lectures from a large pool

- Course of Studies is separated into modules
 - Each module gives a certain number of Credit Points (CP)
 - A complete master consists out of 120 CP
 - The programme estimates 30 CP per semester and the official length is 4 semesters overall
 - If you take longer that is completely fine
- There are 4 general types of modules
 - Lectures
 - Usually 6 or 9 CP
 - 6 CP is 1 lecture and 1 tutorial per week
 - 9 CP is 2 lectures and 1 tutorial per week
 - Usually have a written or oral exam at the end
 - Make up most of the modules in your master

- More types of modules:
 - Lab
 - 9 CP
 - Practical research project under supervision
 - Has a presentation and written report at the end
 - Seminar
 - 4 CP
 - Researching a scientific topic, holding a presentation and writing a report
 - Sometimes includes a peer review process
 - Masters Thesis
 - 30 CP + 2 CP for an accompanying seminar
 - Culmination of your studies, large research project with a written thesis as the result
 - Accompanying seminar ends in a presentation

- There are no compulsory lectures in the Master CompSci
- All lectures are "compulsory elective modules"
- You must select one Lab, one Seminar and write a masters thesis with the accompanying seminar
 - You have (relatively) free selection of the topics

- Modules for the Master Computer Science are separated into 4 tracks
- You choose one track as your main track
 - This is not an explicit choice you tell the university
 - You just have to make sure you meet the CP requirements for tracks
 - Your main track determines how many CP you need to select in each track
- You must complete at least 1 Seminar and 1 Lab in your main track

- Algorithmics
 - Algorithmic Theory, Complexity Theory & Theoretical Computer Science
 - Very math and proof heavy, little to no programming
- Graphic, Vision & Audio
 - Computer Graphics, Animation & Vision, Audio Signal Processing, Image Analysis
- Information & Communication Management
 - Cyber Security
 - Usable Security, Secure System Architecture, IT-Security, Binary Analysis etc.
 - Communication Management in Distributed Systems
- Intelligent Systems
 - Robotics, Machine Learning, Data Science, AI, Autonomous Systems

- Your master must include at least 31 CP in your main track
 - At least one lab and one seminar must be in your main track
- You must select 27 CP outside your main track
 - You must have 6 CP in at least two tracks other than your main
- You must write a masters thesis with an accompanying seminar
 - Its topic does not need to link to your main track
 - The master thesis does not count towards any track
- The last 30 CP are free
- You can have at most 2 labs and 2 seminars in your master

- The lecture IT Security for 6 CP
- One Lab in Cyber Security
- One Seminar in Cyber Security
- A masters thesis with a cyber security focus
- 51 CP are compulsory, the remaining 69 are selected from "compulsory elective modules"

Compulsory Elective Modules

- There are 2 kinds of compulsory elective modules, between which you can split 69 CP:
 - Subject bound compulsory elective modules (54 - 69 CP)
 - Split again into:
 - Subject bound compulsory elective modules cyber security (at least 24 CP)
 - Subject bound compulsory elective modules computer science (at least 12 CP)
 - Non-subject bound compulsory elective modules (0 - 15 CP)
 - Lectures from other master studies
 - Must be allowed on a case by case basis by the examination board
 - Must not cover computer science topics
- Subject bound compulsory elective modules computer science may include at most 1 lab and 1 seminar

CompSci & Cyber - Where do I find lectures to listen to?

- Examination Board publishes module handbooks
 - List all existing modules for their respective study
 - One for Cyber and one for CompSci
- Usually, modules take place either every Winter or every Summer semester
- With one exception all Cyber Security modules are available to Computer Science students
- Most, but not all, Computer Science modules are available to Cyber Security students
 - Most of the Algorithmics track is not available
- Not all modules are available every year
- Available modules can be found on [BASIS \(informatik... → Master Computer Science 2023\)](#)

Beginner Lectures for the Next Semester - Algorithmics

- Cryptography (9 CP)
 - Mathematics behind Cryptography, private-public-key encryption, security reductions
- Elliptic Curves and their Applications in Cryptography (6 CP)
 - Elliptic Curve Cryptography, related Algebra and attacks
- Algorithms for Data Analysis (6 CP)
 - Algorithmic techniques for big data, e.G. Centrality, graph similarity
- Discrete and Computational Geometry (9 CP)
 - Geometric concepts like convex hulls and Voronoi diagrams as well as algorithms to compute them
- High Performance Computing (6 CP)
 - Not actually math, instead computer architecture, parallel programming paradigms etc.
- (Combinatorial Optimization (9 CP))
 - Recommended for first semester on paper, but very in depth and time intensive

Beginner Lectures for the Next Semester - Graphic, Vision, Audio

- Foundations of Audio Signal Processing (6 CP)
 - Analog and digital signal conversion, Fourier transformation, digital filters, various other transforms
- Foundations of 4D/6D Object Capture for Virtual Environments (6 CP)
 - Deep learning for visual data processing, human model representation, geometry processing, rendering for 3D/4D/6D reconstruction etc.
- Computer Vision (9 CP)
 - Linear Filters, Hough transform, segmentation and graph cuts, expectation maximization & other mathematical models for computer vision
- Image Acquisition and Analysis in Neuroscience (6 CP)
 - Image formation & analysis pipelines for medical image analysis

Beginner Lectures for the Next Semester - Security, Information and Communication Management

- IT-Security (6 CP, compulsory for Cyber Security)
 - Various topics of IT security, such as cryptographic protocols, network security, supply chain attacks, low-level analysis, side channel attacks
- Secure Software Engineering (6 CP)
 - Threat modelling, risk analysis, architectural security, secure coding etc.
- Introduction to Sensor Data Fusion - Methods and Applications (6 CP)
 - Kalman Filter, Particle Filter, Multi-Hypothesis-Tracker & other filters & methods for for sensor data fusion

Beginner Lectures for the Next Semester - Intelligent Systems

- Principles of Machine Learning (6 CP)
 - Fundamental machine learning models, clustering, loss functions & optimization functions, modeling, supervised & unsupervised learning
- Algorithms for Data Science (6 CP)
 - Topics vary by year, but usually algorithms for data mining & similar tasks
- Cognitive Robotics (6 CP)
 - State estimation, motion models, self-localization & related problems in robot perception
- Technical Neural Nets (6 CP)
 - Learning vector quantization, back-propagation, support vector machines, Hopfield nets & other techniques for neural nets
- Spatio-Temporal Data Analytics (6 CP)
 - Data structures, representation & analysis of spatio-temporal data as well as predictive models

Get-to-know games

Introductory Questions (some suggestions)

- What's your name?
- What is your course of study (CompSci or CyberSec)?
- What are your hobbies?
- Where did you do your Bachelor & what was your Bachelor Thesis topic?
- What are you excited about in Bonn?
- How old are you?

Examination Regulation

We the Studis

May we have the right to
be understood and known



- The Examination Regulation is a document detailing how the studies are structured
 - Details how many CP you need in what kinds of lectures
 - Details what happens when you fail an exam
 - Details how you apply to exams
 - And a LOT more
- It is also written in German
- Hence we will now list the most important contents

How to sign up for exams

- For labs, seminars and exercises you sign up via BASIS between 17-31 October/April
 - For labs and seminars you usually have to find someone supervising you before the semester, so not relevant to most of you for the first semester
- For lectures you sign up for exams between 1-21 December/June via BASIS
 - For the second exam date you can sign up until 1 week before
- Mails informing you that it's time to register will be sent to your uni mail
- You can de-register from exams up until 1 week before the actual exam date via BASIS
 - This does **not** cost you an exam attempt

- You are considering taking the exam in lecture A, but are not sure yet. When should you sign up for the exam?
 - a) On the 1st of December, as soon as it is possible
 - b) As soon as you are certain you want to take the exam
 - c) On December 21st, the last chance to sign up for the first exam
- It's a) On the 1st of December
 - Reason: You're able to deregister for much longer than you're able to register for an exam

Mandatory Exercises

- Many lectures have mandatory exercise sheets
- Usually 50% of points on some exercise sheets need to be reached
- You are required to pass the mandatory exercises to attend the exam
- Usually also a good way to get a better grip on the subject

Exams - First and Second Attempt

- For lectures there are two exam dates per semester
- If you fail the first attempt you can try again at the second attempt
 - You will have to register for the second attempt again
- It is also possible to register only for the second attempt if the first exam date isn't good for you

Exams - What if you failed?

- If you fail an exam you should go to the post-exam review
- These are usually held shortly after the grades come out by the examiner
- Great place to check where you had problems
- Sometimes it turns out that the examiner missed something or added up points incorrectly, so sometimes you can come out with a better grade
- If you failed in the first attempt of the semester you can sign up for the second attempt
- If you failed in the second attempt you'll have to wait until the next time the lecture is held
 - You won't have to redo exercises the next time, though it may be smart to still do them

Repeatedly failing an exam

- You have 3 attempts per lecture
- Once you fail 3 times you can no longer attempt that exam again
 - If it was a compulsory lecture (IT security for Cyber, nothing for CompSci) you are exmatriculated
 - Exmatriculation means you can no longer study a computer science related subject at any public university in Germany
 - Don't worry. It is exceptionally rare for people to be exmatriculated
- An exercise class can also be passed or failed
 - But you have unlimited attempts to pass an exercise

Passed an exam - But unhappy with the grade?

- If you passed in the first exam period, you can try an improvement attempt
 - Sign up for the second attempt
 - Take the exam again
 - You will get the better of the two results
- Possible up to 3 times (in total over all lectures) and only in the first 3 semesters

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The Institute of Computer Science & Important Stuff around it

Important Buildings

- Most of your lectures will take place in the lecture hall building
- Conveniently it's just a short walk away from the Institute of Computer Science
- The Institute of Computer Science is where most of your tutorials will take place
- The Campo Mensa is also close by
 - You can get cheap & decent food there

- Currently Computer Science in Bonn resides in only one institute, the Institute of Computer Science
- A second institute, the Lamarr Institute, is currently being build up
 - It will mostly focus on AI and ML
- Most of the computer science professors & their phd students & postdocs have offices in the building
- Sometimes there are also events like the Summer Festival of the Student Body and Institute of Computer Science
- For many students a significant part of their student lives take place here

The Institute of Computer Science - II

- The institute is divided into 6 departments
 - These are then subdivided into research groups
 - Each professor heads a research group (and vice versa)
- The Departments are:
 - Department 1: Computational Analytics
 - Researches algorithmic theory and how to efficiently apply it to real problems
 - Department 2: Visual Computing
 - Research computer vision, image computation & image analysis
 - Department 3: Information Systems and Artificial Intelligence
 - Research AI, especially with regards to big data analysis
 - Department 4: Security and Networked Systems
 - Research attacks on IT systems, both on a computer level & with regards to usable security
 - Department 5: Algorithms and Complexity
 - Research the theoretical design of Algorithms and the analysis of their complexity
 - Department 6: Intelligent Systems and Robotics
 - Research robotics & the application of AI in robotics

The Institute as a Workplace

- Some students work at the institute
- Tutoring lectures in which you performed well is a somewhat common job
 - Most of those jobs are for the bachelor, requiring German, but some are for the master as well
- Some students are also parts of research groups
 - Usually support PhD students with their projects & work with them
- It is a great opportunity if you are interested in an academic career after the master
- The payment is pretty bad though
- There is no central job board of the institute, getting jobs often happens in direct communication
 - If you are interested in a job, talk to the relevant professor/postdoc (ideally after doing well in one of their lectures)

Some other neat places

- the botanical gardens are close by and worth a visit
- The yard in front of the Poppelsdorfer Schloss is also a nice place to hang out in summer
- The library is a good place if you are looking for books or just a place to work quietly
- the nearby street Clemens-August-Straße has a few restaurants and food stands (perfect for a pre-gamenight snack!)

- **Library Branches**

- Main Library and MNL Branch Library
- Library card can be picked up at either branch

- **Getting Your Library Card**

- Apply online via form
- Select pickup location and wait for confirmation email
- First card is free; replacement costs 10 €
- Card can also be integrated into the Uni Bonn App

Application form for Uni Bonn Students

- The University offers a variety of different **Sports by Semester**
- Swimming, Running, Climbing, Dance ... as well as a Gym
- Available courses are published in a catalogue at the beginning of each semester
- To partake in the sports and use the gym, you need a **Semester Card**
- Many sports are then available to parttake in with this card. For some, you have to pay a bit more.
- Most courses have limited space, they are bookable on a first-come first-serve basis starting from the date given in their description
 - for many, that date is tomorrow already - but don't panic, you can also sign up later

Time to chat!

More Topics to discuss

We'll be splitting you by your main track.

Here are some more conversation starters:

- Which lectures are you interested in?
- Do you have work experience relating to Computer Science?
- Which parts of the track are you familiar with, and what are your favourite topics?
- What do you like to do in your free time?

Online Services at Uni Bonn

- **BASIS**
 - Central portal for study administration
 - Course catalog, exam/course registration
 - Transcripts and certificates
- **eCampus**
 - Learning management system
 - Lecture materials and assignments
 - Course announcements

- **Uni-ID & Webmail**
 - Personal digital identity at Uni Bonn
 - Required for all services (BASIS, eCampus, Bonnet, etc.)
 - University email for official communication
- **Bonnet / Uni Bonn App**
 - Digital student ID and *Deutschlandsemesterticket*
 - Mobile access to Uni Bonn services
 - Notifications and updates

- **GSG (Gemeinsame Systemgruppe IfI/b-it)**
 - IT support for Informatics and b-it
 - WiFi, VPN, accounts, printers, Overleaf, remote lab PCs
 - Lamarr GPU cluster
- **TVS (Tutorienvergabesystem)**
 - Used by some lecturers to assign tutorials
 - Login with Uni-ID

Student Support

- Provides support and advice for all students
- Legal advice (contracts, exam regulations, official matters)
- Social and psychological support (stress, conflicts, exams)
- Financial aid advice (BAföG, emergency funds)
- Housing guidance, mobility and semester ticket support
- Special services for international students (integration, residence)
- Check out their <https://asta-bonn.de/en>

- Open to all students (incl. international and doctoral)
- Consultations in **English and German**
- Available both **in-person and online**
- Several sessions possible if needed
- Guidance to find therapists or further professional help
- Free of charge and fully confidential

[More info & appointments](#)

- Ensures a safe and respectful atmosphere at events
- Visible contact point for students in case of problems
- Listens, de-escalates, and supports affected persons
- Acts confidentially and respectfully
- approachable outside of events as well