saarland-informatics-campus.de

# Saarland Informatics Campus

## Welcome for Master Students in Cybersecurity

Dr.-Ing. Ben Stock | April 1, 2025

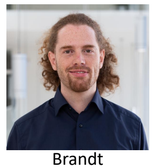
UNIVERSITÄT DES SAARLANDES

SIC Saarland Informatics Campus

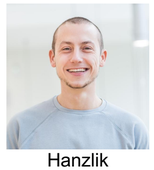
# About CISPA

- (my employer ☺)
- Helmholtz Center for Information Security
- 40+ faculty and senior researchers
- 200+ doctoral/postdoctoral researchers focused on Cybersecurity topics
- 60+ Hiwi students
- Top place for academic research
- Heavily involved in teaching MSc CySec

| # | Institution | Count | Faculty |
|---|---|---|---|
| 1 | CISPA Helmholtz Center | 104.9 | 27 |
| 2 | Georgia Institute of Technology | 67.8 | 27 |
| 3 | Purdue University | 55.9 | 21 |
| 4 | Univ. of Illinois at Urbana-Champaign | 46.6 | 26 |
| 5 | ETH Zurich | 45.4 | 16 |

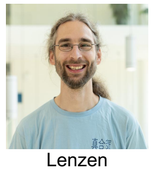

Brandt

Döttling


Hanzlik

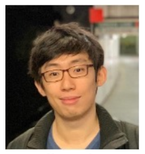
Joux

Loss


Lenzen

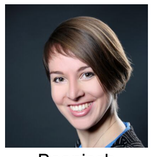
Marx

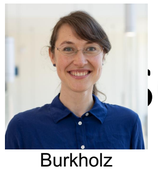
Sasy


Quach

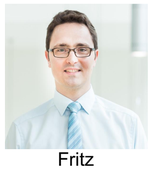
Riepel

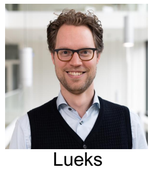
Backes


Boenisch


Burkholz

Dziedzic


Fritz

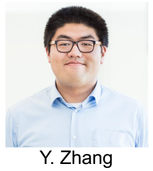

Lueks

Muandet

Stich

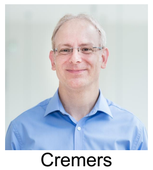
Vreeken

X. Zhang

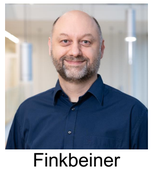

Y. Zhang

**RA1: Algorithmic Foundations & Cryptography**

**RA2: Trustworthy Information Processing**


Cremers

Dimitrova

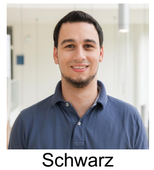

Finkbeiner

Jacobs

**RA3: Reliable Security Guarantees**

Holz

Schönherr

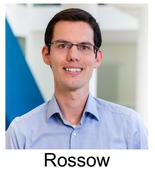

Schwarz

Zeller

**RA4: Threat Detections & Defenses**

Abbasi

Bugiel


Rossow

Singh

Tippenhauer

**RA5: Secure Connected and Mobile Systems**

Fahl

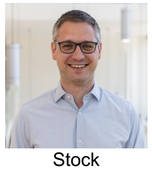
Fass

Golla

Krombholz

Pellegrino

Staicu


Stock

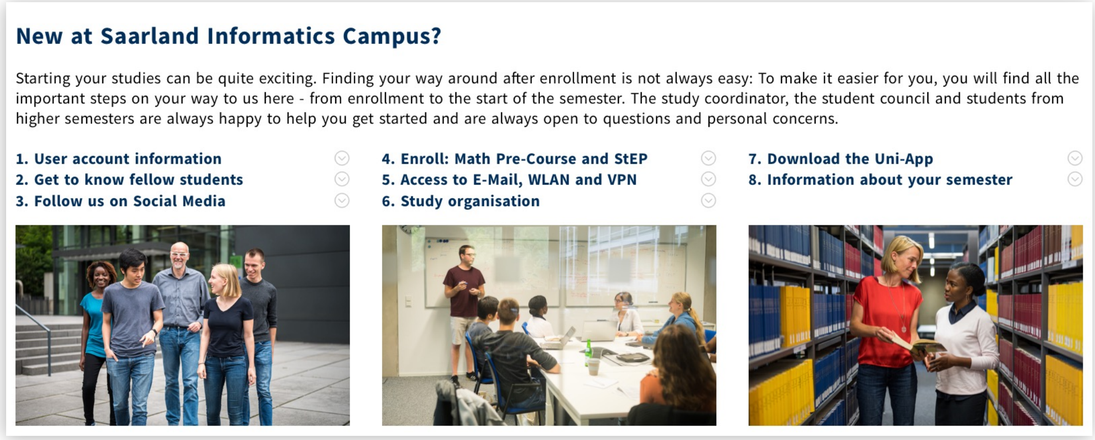
**RA6: Empirical and Behavioral Security**

# Your Studies at Saarland University

YOUR STUDIES

# Summer term 2025

- On April 7, Saarland University will start lectures for the summer semester of 2025.
- Information about courses and tutorials is provided on the web pages of the lecturers and the LSF / HISPOS https://www.lsf.uni-saarland.de/




**Further Information:**

https://saarland-informatics-campus.de/en/semesterinfo/

YOUR STUDIES

# Study Regulations 2021 for Master of Cybersecurity

*Read your study documents carefully!*

Examination regulations, subject-specific regulations, and study regulations: Check the website for the joint examination offices of all faculties of Natural Sciences and Technology

*You must know your rights and duties as a student!*

*https://www.ps-mint.uni-saarland.de/en/programmes/cybersecurity*

# Study Regulations 2021 for Master‘s programme Cybersecurity

1. **27 graded** credits **core lectures** in computer science
    - Security and Cryptography are mandatory subjects (local CySec Bachelor **cannot** take them)
2. **30–34 graded** credits **core lectures in Computer Science, advanced lectures in Cybersecurity, or seminar** in Cybersecurity (here: at most one seminar!)
    - Note: not **pro**seminars (only BSc students)
3. **7 graded** credits in the category of **seminars** in computer science
4. At least **14 ungraded credits** must be acquired by:
    - Further courses in computer science (usually 6-9 CP), Master practical training (6 CP each) in research groups at the CS department
    - Internship in a company (max. 6 CP); approved by the examination board
    - Leading a tutorial (4 CP), Language courses (max. 6 CP, living language)
    - Courses from other departments, which have been applied for and approved by the examination board (e.g., in mathematics, business informatics, or computer linguistics)
5. **12 graded** credits for the **Master‘s seminar** and **30 CP** for the **Master‘s thesis**

# Suggested schedule for MSc Cybersecurity

| | | | | | |
|---|---|---|---|---|---|
| 1 | Security (9 CP) | Core Lecture (9 CP) | Advanced Lecture Cyber Security (6 CP) | Advanced Lecture Cyber Security (6 CP) | 30 |
| 2 | Cryptography (9 CP) | Advanced Lecture Cyber Security (6 CP) | Seminar CySec (7 CP) | Mandatory Elect (8 CP) | 30 |
| 3 | Advanced Lecture Cyber Security (6 CP) | Advanced Lecture Cyber Security (6 CP) | Mandatory Elect (6 CP) | Master's Seminar (12 CP) | 30 |
| 4 | Master's Thesis (30 CP) | | | | 30 |

# Example Course List: All our core courses (offered at least every two years)

Algorithms and Data Structures
Artificial Intelligence
Automated Reasoning
Compiler Construction
Complexity Theory
Computational Logic
Computer Algebra
Computer Architecture
Computer Graphics
**Cryptography**
Data Base Systems
Data Networks
Distributed Systems
Embedded Systems
Geometric Modelling
Human Computer Interaction
Image Processing and Computer Vision
Information Retrieval and Data Mining
Machine Learning
Operating Systems
Optimization
**Security**
Semantics
Software Engineering
Telecommunications
Verification

# Overview of previously taught security lectures

**Practical courses:**

- Web Security, Mobile Security
- Physical-Layer Security, Side-Channel Attacks and Defenses

**Theoretical courses:**

- Privacy Enhancing Technologies
- Verification
- Accountability

**Complementary lectures:**

- Usable Security
- Recht der Cybersicherheit
- Data Analytics

# Course catalogue (#1: LSF)

*How to choose a lecture – for example: a core lecture*

Faculty Mathematics and Computer Science ⟶ Courses on Computer Science

https://www.lsf.uni-saarland.de/qisserver/rds?state=wtree&search=1&trex=step&root120232=356732%7C367629%7C361398%7C360426%7C361978&P.vx=kurz

**Basic Lectures** and **Introductory Seminars** can **only** be taken by **bachelor students!**

# Course catalogue (#2: CISPA CMS)

*How to choose a lecture – example: in Cybersecurity*

https://cms.cispa.saarland

## Winter term 2023/2024

**Games in Machine Learning**
Advanced Lecture - Tatjana Chavdarova, Sebastian Stich

**Machine Learning in Cybersecurity**
Advanced Lecture - Mario Fritz

**Mobile Security**
Advanced Lecture - Sven Bugiel

**Robustness in Machine Learning**
Advanced Lecture - Xiao Zhang

**Security Testing**
Advanced Lecture - Andreas Zeller

**Side-Channel Attacks and Defenses**
Advanced Lecture - Michael Schwarz

**Systems Security**
Advanced Lecture - Ali Abbasi, Thorsten Holz

**Elements of Machine Learning**
Basic and Advanced Lecture - Krikamol Muandet and Jilles Vreeken

**Foundations of Cybersecurity 1**
Basic Lecture - Ben Stock

**Security (WS 2023/2024)**
Core Lecture - Thorsten Holz

**Verification**
Core Lecture - Bernd Finkbeiner

**Perspectives of Entrepreneurial Cybersecurity**
Lecture Series - Sven Bugiel, Giancarlo Pellegrino

**Cybersecurity Lab**
Practical Training - Ben Stock

**CySec Project Winter Term '23/24**
Project - CISPA

**Decision Procedures for Verification and Synthesis**
Proseminar - Rayna Dimitrova

**Usable Security Research to Enhance Online Child Protection**
Proseminar - Carolyn Guthoff, Katharina Krombholz

**Wireless and Mobile Security**
Proseminar - Mridula Singh

**Advanced Theory of Secure Messaging**
Seminar - Cas Cremers

**An Extravaganza of Algorithmic Models**
Seminar - Sebastian Brandt, Alexandre Nolin

**Complexity of Games**
Seminar - Dániel Marx, Tim Hartmann

**Machine Learning Security Reproducibility**
Seminar - Lea Schönherr

**Mining Input Structures**
Seminar - Rafael Dutra + Andreas Zeller

**New Developments in PETS**
Seminar - Wouter Lueks

**Privacy of Machine Learning**
Seminar - Yang Zhang

**Pruning deep neural networks for lottery tickets**
Seminar - Rebekka Burkholz

**Static Program Analysis Lab**
Seminar - Jordan Samhi + Andreas Zeller

**The Web Security Seminar**
Seminar - Aurore Fass, Giancarlo Pellegrino, Cristian-Alexandru Staicu, Ben Stock

YOUR STUDIES

# Course catalogue (#3: Seminars)

*Important: Mandatory bidding deadline for seminars on April 8 23:59!*

https://seminars.cs.uni-saarland.de

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## Seminar Assignment Winter 2024/2025

The central registration for all computer science seminars will open on September 11th.

This system is used to distribute students among the available seminars offered by the CS department. To register for any of the seminars, you have to register here until October 16th, 23:59 CET. You can select which seminar you would like to take, and will then be automatically assigned to one of them on October 18th.

# Preparing for your thesis

- Choose your courses strategically
  - Check out the research that the group does – is that interesting? If so, figure out if they have a lecture/seminar/etc
- Approach (or better: impress) potential supervisors
  - Best case: focus on doing really well in the lecture/seminar of your potential supervisor
- Attend the right Master seminar
  - Idea: see how other people are doing their research (hint: check out the CISPA CMS for details on the seminar even before you start your thesis; you can always attend it even without having a topic)
- Agree on a subject, timeline, and register your thesis
  - My personal approach: develop a thesis proposal to cover the goals **before** registering the thesis
- Find a second advisor
  - All Master theses require two examiners; discuss with your primary advisor early on who takes care of finding the second person
- Consult the student council FAQ for theses: https://cs.fs.uni-saarland.de/en/faq/thesis/

# Contacts (1/2)

**Computer Science Students‘ Representative Council**
Students of different study programmes
E1.3, Raum 107
https://cs.fs.uni-saarland.de/en/

**Study Coordinators: Dr. Rahel Stoike-Sy and Barbara Schulz-Brünken**
Assistance in your study organisation and progress:

- questions about the examination and study regulations
- academic or personal problems
- information about exchange semesters, etc.

Building E1.3, rooms 209 and 207
**Office hours:** Tuesday and Thursday, 11 a.m.-1 p.m.:
Please book your online appointment via MS Teams: https://www.uni-saarland.de/en/department/department-of-computer-science/department.html
**Emails to:** studium@cs.uni-saarland.de

# Contacts (2/2)

**Examination office:**
Administration and processing of your programme achievements:

- Transcript of record
- registration master thesis
- official certificates
- recognition of external academic achievements, etc.

Building E1.3, room 202
**Office hours:** information on website:
Emails to: contact person according to degree programme
https://www.ps-mint.uni-saarland.de/en/home

**SIC System Administration: https://it.cs.uni-saarland.de/**

# Enjoy your studies!
# saarland-informatics-campus.de

SIC Saarland Informatics Campus

UNIVERSITÄT DES SAARLANDES

CBI CENTER FOR BIOINFORMATICS

M2CI CLUSTER OF EXCELLENCE

DFKI German Research Center for Artificial Intelligence

mpii max planck institut informatik

MAX PLANCK INSTITUTE FOR SOFTWARE SYSTEMS