saarland-informatics-campus.de

Saarland Informatics Campus

Welcome for Master Students in Cybersecurity

Dr.-Ing. Ben Stock

UNIVERSITÄT DES SAARLANDES

SIC Saarland Informatics Campus

Your Studies at Saarland University

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

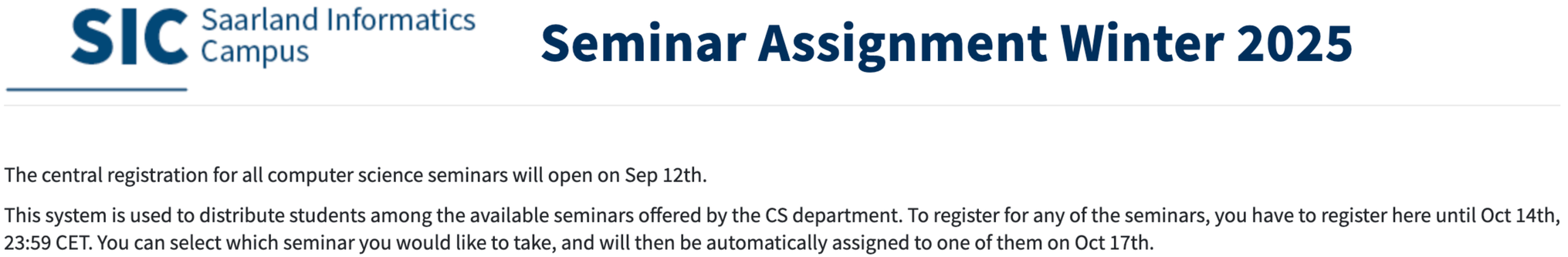
The Web Security Seminar
Seminar - Aurore Fass, Giancarlo Pellegrino, Cristian-Alexandru Staicu, Ben Stock

YOUR STUDIES

Course catalogue (#3: Seminars)

Important: Mandatory bidding deadline for seminars on Tuesday of the first week (23:59)

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



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/

Preparing for your thesis: Example to a thesis in the area of Web Security (similar to many others)

- Winter term: take **Security Core Lecture**
  - Provides overview of all security topics
- Summer term: take **Foundations of Web Security**
  - Provides deep technical knowledge in Web Security; allows students to show they have the technical skills
- Winter term (or in parallel to FoWS): take **Web Security Seminar**
  - Discussion with several researchers (potential thesis advisors); allows students to show they have the research skills
  - Afterwards discuss thesis topics
- Summer term**: write your thesis**

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

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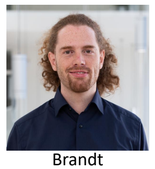
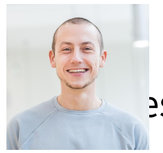

Brandt

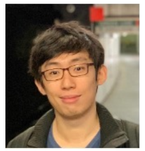

Döttling


Hanzlik


Joux


Marx

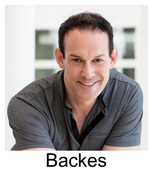

Lenzen


Quach


Sasy


Riepel

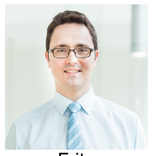
RA1: Algorithmic Foundations & Cryptography


Backes


Boenisch


Burkholz


Dziedzic


Fritz


Lueks


Muandet

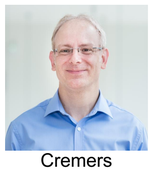

Stich


Vreeken


X. Zhang


Y. Zhang

RA2: Trustworthy Information Processing


Cremers


Dimitrova


Finkbeiner


Jacobs

RA3: Reliable Security Guarantees


Zeller


Schönherr


Schwarz

RA4: Threat Detections & Defenses


Abbasi


Bugiel


Rossow


Singh


Tippenhauer

RA5: Secure Connected and Mobile Systems


Fahl


Fass


Golla


Krombholz


Pellegrino


Stock

RA6: Empirical and Behavioral Security

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!
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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