Welcome to the Department of Computer Science

Professor Ueli Maurer
Director of Studies

14 September 2020
Our Faculty at D-INFK
Faculty Cyber Security
ETH among top 5 Universities for Computer Science in 2020

<table>
<thead>
<tr>
<th>Rank 2020</th>
<th>Institution</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>University of Oxford</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>2</td>
<td>Stanford University</td>
<td>United States</td>
</tr>
<tr>
<td>3</td>
<td>ETH Zurich</td>
<td>Switzerland</td>
</tr>
<tr>
<td>4</td>
<td>Massachusetts Institute of Technology</td>
<td>United States</td>
</tr>
<tr>
<td>5</td>
<td>University of Cambridge</td>
<td>United Kingdom</td>
</tr>
</tbody>
</table>

Start your own Company

46 Academic ETH Spin-offs founded since 1993
D-INFK Master Programs

MSc Data Science

MSc Computer Science

MSc Cyber Security
Some Advice

Take advantage of the unique opportunity of studying at ETH

Attend classes, interact with TAs and faculty

Make this not only a degree, but a major step in your career

Self-reflection
Getting started

Joint Degree Master’s Program
Cyber Security ETHZ / EPFL
Who’s who: Administration Office

• The main point of contact for almost all issues related to Cyber Security (if not, will find the right person), in particular issues concerning
  – administration
  – semester in Lausanne
  – military service (Swiss only)

 ➤ bernadette.gianesi@inf.ethz.ch
Who’s who

Prof. David Basin  
*Head of Department*

Prof. Ueli Maurer  
*Director of Studies*

Prof. Kenneth Paterson  
*Program Director*

Dr. Ralf Sasse  
*Study Coordinator*

Bernadette Gianesi  
*Studies Administration*
Who’s who: Faculty (Core)

Shweta Shinde joins 2020
Information

Cyber Security
www.inf.ethz.ch/master-cybsec

- Study guide
- Regulation of study (in German)
- Course list
  - ....
Master’s program in Cyber Security
We recommend:
Read it!
Credit System

- ECTS credits (European Credit Transfer System)
- Course completed successfully → full amount of credits is awarded
- 30 credits per semester

Master’s program: 120 credits
120 Credit Points

The master’s program is designed to be completed within 4 semesters. The overall study duration must not exceed 8 semesters. The last semester focuses completely on the Master’s thesis.

Recommended CP / Semester

Hard limit at 4 years

4 more semesters of leeway
Grading System

6  Very good
5  Good
4  Sufficient
3  Insufficient
2  Poor
1  Very poor

- **Pass**: grade $\geq 4$
- **Fail**: grade $< 4$
- Resolution for individual grades: 0.25

**Repetition of exams**

Every examination or project can be repeated **once**.
Master’s Program Structure

<table>
<thead>
<tr>
<th>Master ETHZ – EPFL in Computer Science Major in Cyber Security</th>
<th>120</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Courses and Electives in Cyber Security</td>
<td>28</td>
</tr>
<tr>
<td>Core Courses</td>
<td>16</td>
</tr>
<tr>
<td>Core Electives</td>
<td></td>
</tr>
<tr>
<td>Seminar</td>
<td>2</td>
</tr>
<tr>
<td>Core Courses and Electives in a Minor</td>
<td>18</td>
</tr>
<tr>
<td>Core Courses</td>
<td>8</td>
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<td></td>
</tr>
<tr>
<td>Inter Focus Courses</td>
<td>16</td>
</tr>
<tr>
<td>Semester Project</td>
<td>12</td>
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<tr>
<td>Free Electives</td>
<td></td>
</tr>
<tr>
<td>Science in Perspective</td>
<td>2</td>
</tr>
<tr>
<td>Master's Thesis</td>
<td>30</td>
</tr>
</tbody>
</table>

Minimum required credit points
Core Courses and Electives in Cyber Security

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- High level of competence
- Provide essential knowledge in Cyber Security
The minor is mandatory and has to be chosen from one of the following specialization tracks:

- Computational Science
- Distributed Systems
- Information Systems
- Software Engineering
- Theoretical Computer Science
- Visual Computing
Inter Focus Courses - "The labs"

- Cover all topics in computer science
- Teach algorithmic reasoning
- Methods of advanced system design

- You need $\geq 16$ ECTS from Inter Focus courses $\rightarrow$ two courses
- Two offered in autumn semester, two in spring semester
- Repetition typically requires re-enrolling $\rightarrow$ one year later
• Apply acquired knowledge and skills
• Solve independently a technical-scientific problem
Free Electives

- Courses offered by ETH, UZH, EPFL
- Master’s level
• Courses offered by the department D-GESS
• 851-xxxx-xx language courses (≤ 3 credits including ETH BSc)
• Finally!
• 6 months of research, problem solving, writing, …
## Program Structure

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| Inter Focus Courses                         | 16 |

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</table>

| Master's Thesis                             | 30 |

Does not sum up: freedom
Plan your Studies
Planning

Plan your Master’s studies

- Establish a personal study plan, a template you find here: https://inf.ethz.ch/studies/forms-and-documents.html

Where to get information or help:

- At the beginning of the study program, a tutor will be assigned to you
- Study guide
- Studies administration
## Studying

- Register for courses online: [www.mystudies.ethz.ch](http://www.mystudies.ethz.ch)
- Course list: [www.vvz.ethz.ch](http://www.vvz.ethz.ch)

### Cyber Security Master 📚

#### Field of Specialization

#### Core Courses

<table>
<thead>
<tr>
<th>Number</th>
<th>Title</th>
<th>Type</th>
<th>ECTS</th>
<th>Hours</th>
<th>Lecturers</th>
</tr>
</thead>
<tbody>
<tr>
<td>252-0463-00L</td>
<td>Security Engineering</td>
<td>W</td>
<td>7 credits</td>
<td>2V + 2U + 2A</td>
<td>D. Basin, S. Krsis</td>
</tr>
<tr>
<td>252-1414-00L</td>
<td>System Security</td>
<td>W</td>
<td>7 credits</td>
<td>2V + 2U + 2A</td>
<td>S. Capkun, A. Popp</td>
</tr>
<tr>
<td>263-4640-00L</td>
<td>Network Security</td>
<td>W</td>
<td>8 credits</td>
<td>2V + 2U + 3A</td>
<td>A. Perrig, S. Frei</td>
</tr>
</tbody>
</table>

#### Electives

<table>
<thead>
<tr>
<th>Number</th>
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<th>Hours</th>
<th>Lecturers</th>
</tr>
</thead>
<tbody>
<tr>
<td>227-0575-00L</td>
<td>Advanced Topics in Communication Networks (Autumn 2020)</td>
<td>W</td>
<td>6 credits</td>
<td>2V + 2U</td>
<td>L. Vanbever</td>
</tr>
<tr>
<td>227-0579-00L</td>
<td>Hardware Security</td>
<td>W</td>
<td>6 credits</td>
<td>4G</td>
<td>K. Razavi</td>
</tr>
</tbody>
</table>
Semester in Lausanne

School of Computer and Communication Sciences

Our School is one of the main European centers for education and research in the field of Information Technology.
Semester in Lausanne

- Students enrolled at ETH must start the Master’s program in Zurich.
- During the course of the program, one semester has to be spent at EPF Lausanne:
  - Minimum 20 CP, maximum 35 CP;
  - Students receive a scholarship and support in searching accommodation (applies only for spring semester);
  - Eligible courses are published on the MSc Cyber Security website;
  - Master’s thesis and interfocus courses have to be taken in Zurich;
  - Study Plan for the semester in Lausanne has to be approved by the studies administration;
  - During the exchange semester, students are enrolled at ETHZ and EPFL.
# Semester in Lausanne

Study plan (= course list) and regulation (only in French) at EPFL:
https://sac.epfl.ch/study_plan

## Cyber security 2020-21

<table>
<thead>
<tr>
<th>Courses</th>
<th>Code</th>
<th>Programs</th>
<th>Lecturers</th>
<th>Specialisation</th>
<th>Master 1</th>
<th>Master 2</th>
<th>Exam</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced algorithms</td>
<td>CS-450</td>
<td>IN</td>
<td>Kapralov</td>
<td></td>
<td>4h 3h</td>
<td>Written</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>Advanced computer architecture</td>
<td>CS-470</td>
<td>IN</td>
<td>Ienne</td>
<td></td>
<td>3h 2h</td>
<td>Oral</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Cryptography and security</td>
<td>COM-401</td>
<td>SC</td>
<td>Vaudenay</td>
<td>D</td>
<td>4h 2h</td>
<td>Written</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>Database systems</td>
<td>CS-422</td>
<td>IN</td>
<td>Ailamaki</td>
<td></td>
<td>3h 2h</td>
<td>During the semester</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>
On our website: https://inf.ethz.ch/studies/master/master-cybsec/semester_epfl.html information regarding the exchange semester at EPF Lausanne is available. In particular, you find there a list with all EPFL courses showing the according transfer to ETHZ.

**Studies Plan EPFL and Transfer to ETHZ**

**Cyber security 2020-21**

<table>
<thead>
<tr>
<th>Master project</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Code</strong></td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>CS-597</td>
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**Group 1**

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>l</th>
<th>e</th>
<th>p</th>
<th>Semester</th>
<th><strong>CP</strong></th>
<th><strong>Exam</strong></th>
<th><strong>Track D-INFK</strong></th>
<th><strong>Core/Core Elective</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>CS-450</td>
<td>Advanced algorithms</td>
<td>4</td>
<td>3</td>
<td></td>
<td>spring</td>
<td>7</td>
<td>written</td>
<td>TI</td>
<td>Core Elective</td>
</tr>
<tr>
<td>CS-470</td>
<td>Advanced computer architecture</td>
<td>3</td>
<td>2</td>
<td></td>
<td>spring</td>
<td>6</td>
<td>oral</td>
<td>DiSys</td>
<td>Core Elective</td>
</tr>
<tr>
<td>COM-401</td>
<td>Cryptography and security</td>
<td>4</td>
<td>2</td>
<td></td>
<td>autumn</td>
<td>7</td>
<td>written</td>
<td>CybSec</td>
<td>Core Elective</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>Code</th>
<th>Course</th>
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</tr>
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<tbody>
<tr>
<td>CS-422</td>
<td>Database systems</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>spring</td>
<td>7</td>
<td>during the semester</td>
<td>ISys</td>
<td>Core</td>
</tr>
<tr>
<td>CS-438</td>
<td>Decentralized systems engineering</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>autumn</td>
<td>6</td>
<td>oral</td>
<td>DiSys</td>
<td>Core Elective</td>
</tr>
</tbody>
</table>
Semester in Lausanne

Semester in Lausanne *spring semester 2021*

Students have to decide until the end of the 4th semester week at the latest, whether they want to go to Lausanne for spring semester 2021.

Send an email to bernadette.gianesi@inf.ethz.ch until 11 October 2020 with your decision.
Academic Year
Autumn Semester

- **beginning of term**
- **beginning of term**
- **end of term**
- **term break**

**course registration** (until end of 2\textsuperscript{nd} week)

- **examination registration** (until end of 4\textsuperscript{th} week)
- **deregistration end of term examinations**
- **deregistration session examinations**

**end of term examinations**

- **end of term registration**
Spring Semester

- **Course registration** (until end of 2nd week)
- **Examination registration** (until end of 4th week)
- **Deregistration**
  - End of term examinations
  - Session examinations
- **End of term examinations**
Deadlines

- Important deadline (course registrations, exam registration and deregistration, etc.) are always announced ahead of time via e-mail xxxx@student.ethz.ch

- Make sure you read your e-mails!
Preparing Examinations

- Solve the *exercises* during the semester
- Solve *old examinations* (available from the student body, i.e. VIS)
- *Oral examinations*: Get minutes of former examinations from VIS
- If you have *questions*, ask your fellow students or the assistants

*highly, highly, highly recommended* to attend all lectures and exercise sessions
Classes

• **At ETH Zentrum (here):** Classes start a *quarter past* the indicated hour.

• **On Hönggerberg Campus:** depends on exact building course is in! see [https://ethz.ch/students/en/studies/academic-support/course-catalogue/lectures-times.html](https://ethz.ch/students/en/studies/academic-support/course-catalogue/lectures-times.html)

• Also check [https://ethz.ch/students/en/studies/academic-support.html](https://ethz.ch/students/en/studies/academic-support.html) for general information – including lecture recording links, etc

• Example (Zentrum): Class stated to take place from 8 till 10 (8-10)
  - Start at 08:15
  - Have in general a break from 09:00-09:15
  - End at 10:00

  **This rule does *not* apply to exams, meetings, etc.**

• **Autumn semester 2020:** The lecturers will communicate the exact lesson times of ONLINE courses.
All the best for your studies