School of Computer and Communication Sciences - IC

- Internationally highly ranked
- 55 professors
- Internationally recognized
- Strong industrial liaison
- Core + interdisciplinary science: Collaboration with Life Sciences, Mathematics, Microengineering, Electrical Engineering, etc.
Why choose IC?

**CS is everywhere:**
- You can work as a Computer Scientist anywhere, from the largest multinationals to the smallest farm, in the public sector, or at NGOs, or you create your own startup!

**CS changes fast:**
- You won’t get bored.
- You can do many different jobs in the course of one career.

**The world in general, and Switzerland in particular, does not have enough trained Computer Scientists and Engineers:**
- Jobs are easy to find (< 2 months).
- Switzerland needs 10'000 Computer Scientists per year but trains only 3'000 or so, and fewer than 200 in the two ETHs. Average EPF starting salaries are around CHF 85K and CHF 130K after 3–4 years.

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French text:

Les entreprises s’arrachent les jeunes informaticiens

**Recrutement**

La 37e édition du Forum EPFL s’est tenue en fin de semaine dernière au SwissTech Convention Center. Étudiants et recruteurs se sont retrouvés sur les stands des entreprises jeudi et vendredi. Constat: ces dernières déroulent le tapis rouge aux jeunes issus des filières informatiques.

Elles représentent toutes une industrie différente, mais elles recherchent toutes la même chose. La semaine dernière, 190 entreprises étaient présentes au SwissTech Convention Center à l’occasion de la 37e édition du Forum EPFL pour tenter de recruter des ingénieurs pour le développement de logiciels, apprentissage automatique - une des branches de l’intelligence artificielle - et technologie de l’information. Des branches devenues cruciales à l’heure du tournant numérique imposé aux sociétés.

Non seulement ce type de profils ont la cote, mais surtout ils ne sont pas aisés à recruter. Jennifer Naim, spécialiste en ressources humaines chez Sicpa, active dans les systèmes d’authentification, témoigne: «Nous sommes surtout connus pour nos activités en lien avec les encres de sécurité, mais nous avons besoin de plus en plus de besoins dans le digital et dans le softwares engineering. Nous avons donc besoin de nous rapprocher de l’université.»

> «Les personnes issues des domaines de l’informatique sont compliquées à recruter», confirme Franck Guérin, directeur de Continuum International, cabinet de chasseurs de têtes en Suisse romande et en France. D’une part, parce que le nombre de professionnels disponibles est faible par rapport à la forte demande des entreprises. «D’autre part, parce que, lassées d’être assaillies de sollicitations, notamment sur LinkedIn, ces personnes ne sont pas facilement atteignables», poursuit le chasseur de talents.

**Tapis rouge pour les informaticiens...**
Our Master programs

School of Computer & Communication Sciences

- Computer Science
  go.epfl.ch/master-IN

- Communication Systems
  go.epfl.ch/master-SC

- Cyber Security
  go.epfl.ch/master-cyber

- Data Science
  go.epfl.ch/master-DS

Cross-School Programs presented separately

- Neuro_X (STI-SV-IC)

- Quantum Science and Engineering (IC-STI-SB)
This is a joint program between EPFL and HEP-VD to train high school teachers in Computer Science in Switzerland.

The program consists of 120 + 9 ECTS credits, with the first year corresponding to studies in Computer Science, Communication Systems or Data Science, and the second year composed of the Master project and specialization courses at HEP.
Master of Science in
COMPUTER SCIENCE
go.epfl.ch/master-IN

- This Master's program offers a choice of courses that covers all aspects of the discipline, ranging from foundations of computer sciences, software and computer systems to big data and construction of software.

- Students may choose a 30 ECTS specialization or a minor included in the 120 ECTS.

- The program includes a compulsory internship of eight weeks during the summer, or six months during the semester. The internship can also be combined with the master’s project.

### Core courses (min. 32 credits)

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Advanced algorithms</td>
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<td>Advanced computer architecture</td>
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<td>Cryptography and security</td>
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<td>Decentralized systems engineering</td>
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<td>Distributed algorithms</td>
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<td>Information security and privacy</td>
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<td>Modern natural language processing</td>
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<tr>
<td>Systems for data management and data science</td>
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<tr>
<td>TCP/IP networking</td>
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This Master's program provides students with a unique education that places emphasis on the interdependence of mathematics, computer science and electrical engineering. It covers fields like wireless communications, networking and mobility, internet computing, information security and signal processing.

Students may choose a 30 ECTS specialization or a minor included in the 120 ECTS.

The program includes a compulsory internship of eight weeks during the summer, or six months during the semester. The internship can also be combined with the master’s project.

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<td>Information theory and coding</td>
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<td>Mobile networks</td>
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<td>Modern digital communications</td>
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<td>Machine learning</td>
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<td>Statistical signal and data processing</td>
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The Master’s program in data science equips students with all relevant knowledge and skills while combining theoretical foundations with practical experience. It covers a comprehensive education, from the foundations to implementation, from algorithms to database architecture, and from information theory to machine learning.

Students may choose a 30 ECTS minor included in the 120 ECTS.

The program includes a compulsory internship of eight weeks during the summer, or six months during the semester. The internship can also be combined with the master’s project.

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<td>Foundations of data science</td>
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<td>Machine learning</td>
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<td>Modern natural language processing</td>
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<td>Optimization for machine learning</td>
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<td>Statistics for data science</td>
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Master of Science in
Cyber Security
go.epfl.ch/master-cyber
Joint master EPFL Lausanne – ETH Zürich

- In collaboration with ETH Zürich, this joint-degree program offers a broad set of courses such as cryptography, formal methods, systems, network and wireless security. It aims to provide both foundational and applied knowledge in this quickly expanding domain by leveraging expertise from both universities.

- Students are required to spend at least one semester at ETH Zürich where they will take classes counting as breadth and depth courses.

- Upon graduation, students receive a joint Master of Science from both EPFL and ETHZ.

- The program includes a compulsory internship of eight weeks during the summer, or six months during the semester. The internship can also be combined with the master’s project.

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ETHZ courses counting as breadth requirement
Prerequisite bachelor courses

- If you are thinking of changing your field of study, prepare by taking these prerequisite courses during your bachelor.
- Admission is competitive. We want to see that you do well in our courses and that you are motivated.

- For computer science
  - Software construction, 8 cr, 2nd year, fall
  - Algorithms, 8 cr, 2nd year, spring
  - Computer systems, 8 cr, 2nd year, spring

- For cyber security
  - Software construction, 8 cr, 2nd year, fall
  - Computer systems, 8 cr, 2nd year, spring
  - Computer security and privacy, 4 cr, 3rd year, fall
  - Algebra, 4 cr, 3rd year, fall (except for MA, PH, & CH)

- For communications systems
  - Computer systems, 8 cr, 2nd year, spring
  - Modèles stochastiques pour les communications, 6 cr, 3rd year, fall
  - Signal Processing, 8 cr, 2nd year, fall (except EL, MT, SV)

- For data science
  - Algorithms, 8 cr, 2nd year, spring
  - Data-Intensive systems, 6 cr, 3rd year, spring
  - Prob Stats, 6 cr, 2nd year, fall (only external EPFL candidates)
What happens if I do not take the prerequisites during my bachelor?

- Should you be admitted, your admission to the Master’s program will be conditional on acquiring the additional credits.
- Priority must be given to acquiring these credits during your first-year of study.
- The credits will not count towards your Master’s degree.
- You may take Master courses in parallel with your admission conditions, but it will be your responsibility to deal with schedule overlaps, etc.
- Admission conditions are non-negotiable and cannot be modified.
- It’s best to take these courses during your Bachelor to show your motivation to apply.
Specializations and Minors

Specializations
- Computer engineering
- Computer science theory
- Cyber security
- Data analytics
- Foundations of software
- Internet information systems
- Networking and mobility
- Signals, images & interfaces
- Software systems
- Wireless communications

Some examples of Minors taken by IC students
- Computational Biology
- Computational Science & Eng.
- Financial Engineering
- Management, Technology and Entrepreneurship
- Mathematics
- Neuro-X
- Quantum Science & Eng.
- Spatial Technologies
Industry Internships

- Mandatory for all EPFL MS students since 2010
- Gain valuable work experience, develop and refines your skills
- Explore a career path
- Can be done in Switzerland or abroad. IC has a database of more than 3000 industry contacts

- Internship models:
  - Short, 8 weeks minimum during the summer
  - Long, 6 months during a semester
  - Integrated with your Master Project (26 weeks)
Internships: Host testimonials

"Since we started hosting several interns as part of the EPFL internship program, we have been pleased with these students' hard work and contributions. I always enjoy interacting with these bright young students. We look for unique views these interns can bring. I hope they see IBM Research as a very exciting place to work."

Giovanni Pacifici, IBM T.J. Watson

“EPFL has been doing an excellent job at providing us the best internship candidates for our needs. Everything from selecting the candidates to managing administrative issues has been handled smoothly and efficiently, allowing us to focus on the students and the work to be done.”

Stein Lundby, Qualcomm Inc.
**COMPUTER SCIENCE**
What I liked the most was everyone’s commitment, the experience of being there with all these motivated people.

*Acacio Da Silva Martins*
Senior Software Engineer, AdNovum

**DATA SCIENCE**
I feel like I have a tailored, personalized master’s degree with exactly the courses I wanted. It’s the dream scenario.

*Emma Lejal Glaude*
Data, Analytics and AI Engineer, Swisscom

**CYBER SECURITY**
The teaching team is really great, it’s so motivating to be working alongside the very best and life on campus is excellent. There is some much to do!

*Mathilde Aliénor Raynal*
PhD student, EPFL Doctoral program in computer and communication sciences

**COMMUNICATION SYSTEMS**
It’s been almost 10 years since my master’s and our group are still very good friends, even if we are spread out all around the world!

*Arthur Germain*
CEO, OneDoc
Minors offered by IC

- We also offer several minors. This can be a very good option if are hesitant to change section.
- Condition: min 30 credits from a list of pre-defined courses in:
  - Computer science
  - Communication systems
  - Data science
  - Cyber security
  - Computational biology
How to apply - Master?

go.epfl.ch/master-application

- 1st admission cycle
  ➢ deadline December 15

- 2nd admission cycle
  ➢ deadline April 15

Criteria for admission

- Necessary requirement min. GPA 4.5
- Taken some BS prerequisite courses with good results
- Quality of application, relevance of BS program compared to the MS cursus of interest, motivation, ...
Merci