Your path to a PhD

During your PhD

- You have an advisor(s)
  - With you until defense
  - Courses, research, career planning
  - Annual feedback (evaluations)

- You have a mentor
  - Program committee contact person + a “buddy” (older PhD) for first year
  - Faculty member beyond (from outside area)
  - Someone to talk to in general
EDIC Program Committee: Contact Persons

- Your point of contact for the entire first year for any questions or guidance
- For fellowship students, advice may especially be valuable in the spring for your 2nd semester project in a lab
- Do try to meet with your contact person 1-2 times, even if it is just for a general update on your progress
Whilst you are here … make sure that faculty get to know you

- **Why?**
  - Your career starts here, need reference letters!
  - Most of top/well-known people you come across in the next five years are right here

- **How?**
  - Take courses, be visible
  - Organize research seminars
  - Excel in TAing (teaching assistance)

- **When it’s letter writing time, faculty will remember!**
## Your first year with EDIC ...

<table>
<thead>
<tr>
<th>PhD Orientation (2 weeks)</th>
<th>First Year (Fellowship &amp; Direct Hires)</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="https://go.epfl.ch/phd-edic-orientation">https://go.epfl.ch/phd-edic-orientation</a></td>
<td><a href="https://go.epfl.ch/phd-edic-requirements">https://go.epfl.ch/phd-edic-requirements</a></td>
</tr>
<tr>
<td><strong>September 2-13</strong></td>
<td><strong>Fall Semester</strong></td>
</tr>
<tr>
<td>French classes</td>
<td>First project</td>
</tr>
<tr>
<td>Administrative tasks</td>
<td>Depth course</td>
</tr>
<tr>
<td>Research seminars</td>
<td>Potential matching *</td>
</tr>
<tr>
<td>Social events</td>
<td><strong>Spring Semester</strong></td>
</tr>
<tr>
<td>Matching process *</td>
<td>Second project</td>
</tr>
<tr>
<td><strong>September 17</strong></td>
<td>Candidacy exam</td>
</tr>
<tr>
<td>Semester start</td>
<td></td>
</tr>
</tbody>
</table>

* => fellowship students

* => fellowship students
All are encouraged to attend the research seminars ... even outside of your area(s) of interest!

Schedule at: https://go.epfl.ch/phd-edic-research-seminars

<table>
<thead>
<tr>
<th>Date</th>
<th>Faculty</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Week 1</strong></td>
<td></td>
</tr>
<tr>
<td>Sept. 3 - Tuesday</td>
<td>Troncoso; Fua/Salzmann; Macris; Koch</td>
</tr>
<tr>
<td>Sept. 4 - Wednesday</td>
<td>Payer; Guerraoui; Ienne</td>
</tr>
<tr>
<td>Sept. 5 - Thursday</td>
<td>Boulic; Larus; Jakob; Grossglauser</td>
</tr>
<tr>
<td><strong>Week 2</strong></td>
<td></td>
</tr>
<tr>
<td>Sept. 9 - Monday</td>
<td>Ailamaki; Gastpar; Vaudenay; Bugnion</td>
</tr>
<tr>
<td>Sept. 10 - Tuesday</td>
<td>Thiran; Pauly; Abbé; Zamir; Vetterli/Scholefield</td>
</tr>
<tr>
<td>Sept. 11 - Wednesday</td>
<td>West; Dillenbourg; Süsstrunk; Flammarion</td>
</tr>
<tr>
<td>Sept. 12 - Thursday</td>
<td>Falsafi; Jaggi; Aberer; Ford</td>
</tr>
<tr>
<td>Sept. 13 - Friday</td>
<td>Faltings; De Micheli/Riener; Kuncak; Cevher</td>
</tr>
</tbody>
</table>
Fellowship students: this week + next

[https://go.epfl.ch/phd-edic-research](https://go.epfl.ch/phd-edic-research)

- **Contact IC faculty (if you haven’t already done so!)**
  - In your areas of interest
  - Make sure you have familiarized yourself with their work
  - Meet them/their group ASAP

- **Attend the research seminars**

- **When approaching faculty**
  - Make sure they have a slot to hire next year
  - Sign up for a semester project with them
What is urgent?

- **Course registration**
  
  [https://go.epfl.ch/phd-edic-course-registration](https://go.epfl.ch/phd-edic-course-registration)
  
  - Deadline **September 25, 2019**
  - A detailed email has already been sent

- **Need at least**
  
  [https://go.epfl.ch/phd-edic-course-catalogue](https://go.epfl.ch/phd-edic-course-catalogue)
  
  - One EDIC depth course (former EPFL MS students who have fulfilled the depth requirement, should take one breadth course)

  [https://go.epfl.ch/phd-edic-projects](https://go.epfl.ch/phd-edic-projects)
  
  - One semester project
    
    - Fellowship students need to find a prof./lab
Semester Projects

https://go.epfl.ch/phd-edic-projects

- 12 of 30 credits come from projects in your first year
- 14 weeks per semester // 6 credits per project
- Written report and oral presentation after each project
- Projects especially important for fellowship students to identify a lab/thesis advisor(s)

<table>
<thead>
<tr>
<th>Schedule &amp; submission deadlines</th>
<th>fall semester</th>
<th>spring semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course &amp; project registration form</td>
<td>Sep. 25, 2019</td>
<td>Feb. 26, 2020</td>
</tr>
</tbody>
</table>
Depth and breadth requirements

**Why?**
- **Depth**: experts in your area
- **Breadth**: know a bit outside of research focus

**Depth => 1st year**
Students should choose a depth area from:
- AI, Systems, Theory
  - Must pass depth course with a grade of 5.0
  - Must pass the candidacy exam
Both conditions should be met to progress (do not take this lightly!)

**Breadth => over course of PhD**
- Once depth area chosen, other 2 areas considered breadth
  - Must pass one breadth course of min. 4 credits from each of the breadth areas
# Depth courses

[https://go.epfl.ch/phd-edic-course-catalogue](https://go.epfl.ch/phd-edic-course-catalogue)

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Sem.</th>
<th>AI</th>
<th>SY</th>
<th>TH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Multiprocessor Architecture</td>
<td>6</td>
<td>Fall</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cryptography &amp; Security</td>
<td>7</td>
<td>Fall</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Design Tech. for Integrated Systems</td>
<td>6</td>
<td>Fall</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distributed Algorithms</td>
<td>6</td>
<td>Fall</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Formal Verification</td>
<td>6</td>
<td>Fall</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Information Theory &amp; Coding</td>
<td>7</td>
<td>Fall</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Information Theory &amp; Signal Processing</td>
<td>6</td>
<td>Fall</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Information Security &amp; Privacy</td>
<td>6</td>
<td>Fall</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Intelligent Agents</td>
<td>6</td>
<td>Fall</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machine Learning</td>
<td>7</td>
<td>Fall</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mathematical Foundations of Signal Processing</td>
<td>6</td>
<td>Fall</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Principles of Computer Systems</td>
<td>7</td>
<td>Fall</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Advanced Algorithms</td>
<td>7</td>
<td>Spring</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Advanced Probability &amp; Applications</td>
<td>6</td>
<td>Spring</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Database Systems</td>
<td>7</td>
<td>Spring</td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>
Breadth courses

- Any 4xx or above from IC or related programs
- List online at: [https://go.epfl.ch/phd-edic-course-catalogue](https://go.epfl.ch/phd-edic-course-catalogue)

### AI
- COM-480 Data visualization
- COM-514 Mathematical foundations of social science
- CS-401 Applied data analysis
- CS-411 Digital education and learning analysis
- CS-413 Computational photography
- CS-430 Intelligent agents
- CS-431 Introduction to natural language processing
- CS-433 Machine learning
- CS-439 Optimization for machine learning
- CS-440 Advanced computer graphics
- CS-442 Computer vision
- CS-444 Virtual reality
- CS-446 Digital 3D geometry processing
- CS-456 Artificial neural networks
- CS-486 Human-computer interaction
- CS-489 Personal interaction studio
- CS-718 Topics in computational social sciences
- CS-720 Advances in data intelligence
- EE-511 Sensors in medical instrumentation
- EE-512 Biomedical signal processing
- EE-550 Image and video processing
- EE-552 Media security
- EE-554 Automatic speech processing
- EE-556 Mathematics of data: from theory to practice

### Systems
- COM-413 Real-time networks
- COM-414 Satellite communication systems and networks
- COM-430 Modern digital communications: a hands-on approach
- COM-502 Dynamical system theory for engineers
- COM-503 Performance evaluation
- COM-506 Student seminar: security protocols and practices
- CS-420 Advanced compiler construction
- CS-422 Database systems
- CS-423 Distributed information systems
- CS-438 Decentralized systems engineering
- CS-470 Advanced computer architecture
- CS-471 Advanced multiprocessor architecture
- CS-472 Design technologies for integrated systems
- CS-473 Embedded systems
- CS-476 Real-time embedded systems
- CS-487 Industrial automation
- CS-490 Business design for IT services
- CS-491 Enterprise and service-oriented architecture

### Theory
- COM-405 Mobile networks
- COM-417 Advanced probability and applications
- COM-421 Statistical neurosciences
- COM-500 Statistical signal and data processing through applications
- COM-501 Advanced cryptography
- COM-512 Networks out of control
- COM-514 Mathematical foundations of signal processing
- COM-516 Markov chains and algorithmic applications
- COM-611 Quantum information theory and computation
- COM-702 Advanced topics in cryptography
- COM-712 Statistical physics for communication and computer science
- CS-435 Analytic algorithms
- CS-437 Algebraic coding theory
- CS-448 Sublinear algorithms for big data analysis
- CS-450 Advanced algorithms
- CS-451 Distributed algorithms
- CS-452 Foundations of software
- CS-453 Concurrent algorithms
- CS-454 Convex optimization and applications
- CS-455 Topics in theoretical computer science
## EDIC graduation requirements: 30 credits

<table>
<thead>
<tr>
<th>Year 1 of PhD</th>
<th>External PhD Students</th>
<th>Credits</th>
<th>Internal PhD Students</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Semester project (fall)</td>
<td>6</td>
<td>Semester project (fall)</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Semester project (spring)</td>
<td>6</td>
<td>Semester project (spring)</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Depth Course [x 1](^a)</td>
<td>min. 6</td>
<td>Depth course (^a; c)</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>Breadth [x 1](^b)</td>
<td>min. 4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Credits - 1\(^{st}\) Year

- min. 18

### Year 2 onwards

<table>
<thead>
<tr>
<th>Year 2 onwards</th>
<th>External PhD Students</th>
<th>Credits</th>
<th>Internal PhD Students</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Breadth Courses [x 2](^b)</td>
<td>min. 8</td>
<td>Breadth course [x1](^b)</td>
<td>min. 4</td>
</tr>
<tr>
<td></td>
<td>EDIC course catalogue or other MS/doctoral courses</td>
<td>min. 4</td>
<td>EDIC course catalogue</td>
<td>min. 6</td>
</tr>
<tr>
<td></td>
<td>Other MS/doctoral courses</td>
<td>max. 4</td>
<td>Other MS/doctoral courses</td>
<td>max. 4</td>
</tr>
</tbody>
</table>

### Credits - 2\(^{nd}\) Year onwards

- min. 12

### 30 Credits

\(^a\) All PhD students are required to choose a depth area: AI, Theory, Systems. The passing grade for the depth course is 5.0 or better. Students have 2 attempts (fall and spring) to pass their depth course. Retake of the same course is not possible; a different course must be chosen.

\(^b\) The other two areas outside the depth area are defined as breadth. PhD students must obtain a minimum of 4 credits in each of the two areas.

\(^c\) EPFL MS students who have obtained a grade of 5.0 in a depth course prior to enrolling in the EDIC PhD program have fulfilled the depth course requirement.
EPFL requires that all PhD students contribute to teaching activities

You will

• Be assigned by your advisor or the program admin to assist a bachelor or master course during the semester
• Proctor and grade written exams
• Act as an Observer for oral exams and/or Supervisor for some written exams. You will be informed of your assignments by the admin office twice a year (Nov. & April)

Exceptions to the rule are

• First + last semester in the program
• First year students having failed candidacy
Candidacy exam … the philosophy
https://go.epfl.ch/phd-edic-candidacy-exam

- After your 1st year of PhD you can
  - Read, understand and explain technical papers
  - Present them briefly and explain how they influence your work
  - Answer questions about the papers, your write-up and BS/MS background material in the area

- Exam focused on
  - Presentation, submitted material + basic background
  - Both depth and breadth

- What this exam is not
  - A comprehensive exam for all work in an area
  - Anything the faculty feel “you ought to know”
Candidacy exam ... evaluation criteria
https://go.epfl.ch/phd-edic-candidacy-exam

- Writing skills
- Oral skills
- Depth and breadth of knowledge
- Ability to interpret results
- Critical thinking and problem solving skills

There will be a full presentation on the candidacy exam in February 2020
• From your 2nd year onwards
  • You and your advisor(s) fill out a form and discuss your progress, etc.

• EDIC program committee
  • Reviews all “needs improvement” and “unsatisfactory” cases
  • Identifies a shortlist of top performers (e.g., invitation to speak at Open House, fellowship and award nominations, etc.)

• Why? We want to know if we can help …
  • Discuss concerns at the program committee level
  • Bring it up to advisor/mentor’s attention
  • Make sure you and your advisor(s) are on the same page

• Mid-year evaluations scheduled for “needs improvement” or “unsatisfactory”
Last but not least ... you must take your vacation days!

- Five weeks of legal vacation days per year
  - Be sure to take your vacation before you are transferred to a lab and enter all your days in the online tool: [https://absences.epfl.ch](https://absences.epfl.ch)
Any questions ... ask EDIC staff
https://go.epfl.ch/phd-edic
edic@epfl.ch

Cecilia Chapuis
Admissions
1st Year Students
Candidacy Exam

Madeleine Robert
General Admin
Courses
Annual Evaluations

Eileen Hazboun
Applications
Industrial Awards
Liaison with IC
School & Deanship

Your obligation: answer their emails!
See you at the Welcome Party!