

Cti Evaluation 2018 - Document A

Request for the extension of accreditation and attribution of the European label EUR-ACE by Cti for 3 of the diplomas in engineering of the Ecole Polytechnique Fédérale de Lausanne (EPFL)



Alain Herzog / EPFL

Lausanne, January 30th, 2018

ADVERTISSEMENT

IMPORTANT NOTICE BEFORE READING THE EPFL SELF-ASSESSMENT REPORT

The present self-assessment report is an adapted version of the 2014 report, done the closest as possible to the Cti International References- Guidelines approved by CTI's plenary assembly on the 14th of November 2017. However, the strategy followed for its redaction, and the intended competencies profiles are similar to that previously used for the joined visite done by Cti/OAQ in 2014, the study plan of section were already defined 12 months before the publication of the aforementioned Cti referential of 2017.

Indeed, there is, firstly, a **Central document, A**, this one, describing the majority of the quality assurance processes and policy conducted at the school or institutional levels (EPFL and ETH Domain). In a **second document, B**, the Section Directions, needing to (re)accredited their masters, have revised and adapted their self-assessment report according to the points to consider and recommendations made by the Cti in 2015 *. However It should be mentioned here, that the intended learning outcomes and competency profiles are still those presented in the former references and guidelines of Cti used by EPFL for the accreditation in 2014.

*** Official decision taken and approved by the CTI General Assembly of the Cti in Paris, on the 9th of June 2015, concerning:**

“Avis n° 2015/05-05 relatif à l'admission par l'État de diplômes de master délivrés par l'Ecole polytechnique fédérale de Lausanne (EPFL) - Suisse

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Mention is made in this document of Titles such as professors, teachers, researchers, PhD students, students, employees etc.. These words describe a function or status for women and men, without distinction.

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List of Acronyms

ACIDE	EPFL Association of Research Scientists and Lecturers (Association du Corps intermédiaire de l'EPFL)
AE	EPFL Assembly
AMBA	The Association of MBAs
AUF	Agence Universitaire de la Francophonie
BaMA	Bachelor and Master School
CAPE	Teaching Support Center (Center d'Appui à l'Enseignement)
CARE	Center Asiatique de Recherche sur l'Eau
CAS	Certificate of Advanced Studies
CC	Career Center
CCMX	Competence Center for Materials Science and Technology
CdF	Federal Audit Office
CDH	College of Humanities
CDM	College of Management
CdS	Conference of the Directors of programs (Conference des directeurs de section)
CEPF	ETH-Board: ETH Domain's strategic management and supervisory body
CESAER	Conference of European Schools for Advanced Engineering Education and Research
CFA	Chartered Financial Analyst
CH	Switzerland
CIB	Center Interfacultaire Bernoulli
CLUSTER	Consortium Linking Universities of Science and Technology for Education and Research
CMS	Special Mathematics Course (Coura de Mathématiques spéciales)
CODEV	Cooperation & Development Center
COSEC	Specific training for security correspondents
CRAFT	Teacher support unit and Research lab on training technologies
CREM	Center de Recherches Energétiques et Municipales
CRM	Risk Management Committee
CRUS	Rector's Conference of the Swiss Universities (Conférence des recteurs des universités suisses)
CSEM	Swiss Center for Electronics and Microtechnology
CTI	Commission for the Promotion of Innovation
CULF	Center Universitaire Lausannois en Finance
CURES	Center Universitaire de Recherche sur l'Energie pour la Santé
DAF	Educational Affairs (Domaine de la formation)
DAS	Diploma of Advanced Studies
DDC	Data Distribution Center
DTU	Technical University of Denmark
EADI	European Association of Development Research and Training Institutes
EAWAG	Swiss Federal Institute of Aquatic Science and Technology
EC	European Commission
ECAL	Cantonal University of Art and Design (Ecole cantonale d'Art de Lausanne)
ECP Paris	Ecole Centrale Paris
ECTS	European Credit Transfer and Accumulation System
edX	Platform for Online (MOOCs) courses
EMPA	Swiss Federal Laboratories for Materials Science and Technology
ENABLE	Program of the Technology Transfer Office
ENAC	School of Architecture, Civil and Environmental Engineering
ENS	Ecole Normale Supérieure Paris
ENSPY	Ecole Nationale Supérieure Polytechnique de Yaoundé
EPFL	Swiss Federal Institute of Technology in Lausanne (Ecole Polytechnique fédérale de Lausanne)
EPUL	Ecole polytechnique de l'Université de Lausanne
ERC	European Research Council
ETH	Swiss Federal Institutes of Technology
ETH-Board	Board of Swiss Federal Institute of Technology (= CEPF)
ETHZ	Swiss Federal Institute of Technology in Zurich (Eidgenössische Technische Hochschule Zürich)
EUGA	EPFL UNIL Golf Association
FIT Act	Federal Act on the Federal Institute of Technology
FOBS	Compulsory Basic Safety Training

FSB	School of Basic Sciences
GRI	Global Report Initiative (GRI)
GULF	The Global University Leaders Forum
HEI	Graduate Institute of International and Development Studies (Institut universitaire de Hautes études Internationales)
HES	University of Applied Sciences
HKUST	Hong Kong University of Science and Technology
HPC	High Performance Computers
HR	Human Resource
IC	School of Computer and Communication Sciences
ICC	Information, Computation and Communication
IDIAP	Dalle Molle Institute of artificial and perceptive intelligence
IdM	Association Ingénieurs du Monde
IMT-NE	Institute of Microtechnology in Neuchâtel
IRO	Research Institute in Ophtalmology (Institut de Recherche en Ophtalmologie)
ISAE	Institut Supérieur de l'Aéronautique et de l'Espace
ISCN/GULF	International Sustainable Campus Network / Global University Leaders Forum
ISO	International Organization for Standardization
IEC	International Electrotechnical Commission
ISREC	Swiss Institute for Experimental Cancer Research
ITER	Project aimed to lead to international cooperation on the development of a new form of energy
KAIST	Science & Technology Office Seoul - Korea
KAUST	King Abdullah University of Science and Technology - Saudi Arabia
KFPE	Commission for Research Partnerships with Developing Countries
KTH	Royal Institute of Technology - Sweden
MAS	Master of Advanced Studies
MIPT	Moscow Institute of Physics and Technology
MIT	Massachusetts Institute of Technology
MOOCs	Massive Open On-line courses
MTE	Master in Management, Technology and Entrepreneurship
NCCR	National Competence Centers for Research
NRF	National Research Foundation
NTU	Nanyang Technological University - Singapore
NUS	National University of Singapore
OAQ	Swiss Accreditation office (Organe d'accréditation des Hautes Ecoles Suisses)
OGIF	Organisation et Gestion Informatique de la Formation
PATT	Professor Assistant Tenure Track
PhD	Doctor of Philosophy
PMU	Policlinic Medical University
PPP	Public Private Partnership
PSI	Paul Scherrer Institut
QA	Quality Assurance
QCM	Question à choix multiples
QMS	Quality Management System
RC	Research Commission
RCFE	Réseau romand de conseil en formation et évaluation pour l'enseignement universitaire
RESCIF	Network of Excellence in Engineering Sciences of the French-speaking Community (Réseau d'Excellence des Sciences de l'Ingénieur de la Francophonie)
RUMBA	Swiss Federal Government Program for Resource and Environmental Management
SAE	Department of Student Affairs (Service des affaires estudiantines)
SAP	German company, leader in enterprise software and software-related services.
SdA	Management meeting of the VPAA central administration (séance de l'administration académique)
SEFRI	State Secretariat for Education, Research and Innovation
SHS	Humanities and Social Sciences
SMEs	Small and Medium Enterprises
SNSF	Swiss National Science Foundation
SPE	Study Programs Promotion Service
STEM	Science, Technology, Engineering and Mathematics

STI	School of Engineering
SUVA	Swiss Accident Insurance
SV	School of Life Sciences
Swiss TPH	Swiss Tropical and Public Health Institute
TTO	Technology Transfer Office
TU/e	Eurotech Universities
TUM	Technical University of Munich
UAE	United Arab Emirates
UK	United Kingdom
UNESCO	United Nations Educational Scientific and Cultural Organization
UNIBE	University of Bern
UNIGE	University of Geneva
UNIL	University of Lausanne
VNU-HCM	Vietnam National University - Ho Chi Minh City
VPAA	Vice Presidency for Academic Affairs
VPIV	Vice-presidency for Innovation and Technology Transfer
VPPL	Vice-Presidency for Planning and Logistics
VPSI	Vice-presidency for Information Systems
WSL	Swiss Federal Institute for Forest, Snow and Landscape Research

INTRODUCTION

EPFL

Founded in 1853, as the *École Spéciale of Lausanne*, by former students of French Engineering Schools (particularly Mines), the institution was incorporated in the first half of the twentieth century in the University of Lausanne and became EPUL (*Ecole Polytechnique de l'Université de Lausanne*). It began a dramatic growth when becoming EPFL, *Ecole Polytechnique Fédérale de Lausanne* in the late 1960s. Forty years after its federalization, EPFL is now internationally recognized as a cutting-edge institute of technology that bases its development on an innovative education and technological research, participating to the resolution of global issues, and at the same time contributing to competitive innovative partnerships with industry to support Swiss economy.

Alongside its internationalization, including its site campus in Ras Al Khaimah in the Middle East, EPFL has affirmed its commitment to accelerate the transfer of technology by taking advantage of the strong balance between existing scientific and technological developments of the ETH schools and specializations of the Swiss economy. Given the role of the regions in Switzerland, their specific skills and potential for thematic development, EPFL has in recent years strengthened its regional impact through collaborations with the French-speaking cantons of Geneva, Fribourg, Neuchâtel and Wallis. To this end it has created by specific “Antennas” (see fig. 1-1). This strategy is part of a coherent framework of development asserting itself around the new “EPFL hub”. Such developments will also enhance the visibility of Swiss research, and increase the benefits for the Swiss economy as a whole. In addition, beyond occasional and specific projects, the creation of these antennas will also structurally favor natural interactions and synergies between our institution and the universities, and universities of applied sciences (HES) in the Western part of Switzerland.

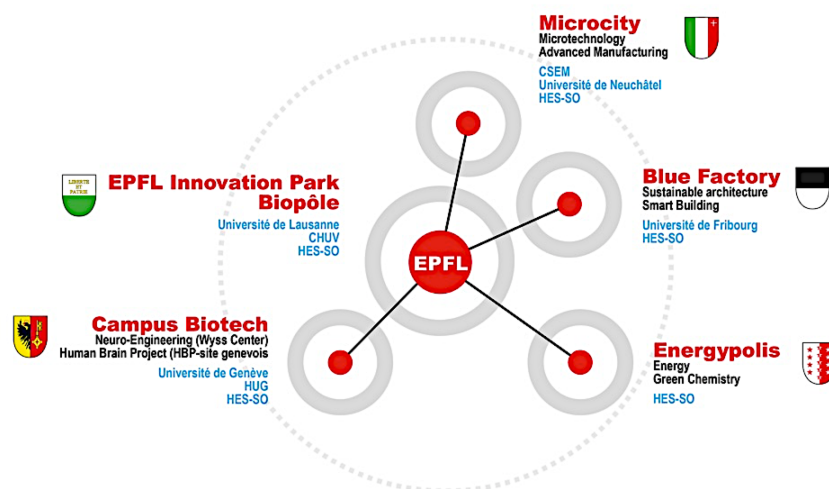


Figure 1-1

Governance

Since its inception, [the governance of EPFL](#) is defined by a presidential system tempered by a broad participation. In short, the present structure is segmented as follows:

The management of our School has a presidency supported today by six Vice-presidents, for *Education, Research, Innovation, Finances, Human Resources and Operation, and Information System*. Deans or Directors, with a wide autonomy and, consequently, responsibilities, head schools and colleges that report to the EPFL presidency.

Education and Research are carried out in the teaching sections and institutes respectively, attached to a School or a College. The institutes include research units and laboratories and specialized service- providing centers support their activity. The Vice-president for Education is in charge of the execution of specific bachelor, master, and doctoral programs. The Vice-presidency for education also coordinates the activities of Directors of programs (in French: Directeurs de section) integrated in the EPFL Schools and Colleges, in charge of the operational management of their educational programmes.

Policy and cultural evolution of the institution

Since the early 2000s with the nomination of its former President, Professor Patrick Aebischer, EPFL has lived a profound change in its orientation to become a research-intensive technological institution. This results, as strategically decided by EPFL general management, from a significant change in the processes leading to the renewal of its professors. They are now hired at the highest international level in order to strengthen existing, or develop new research domains.

This move has brought with it a new breath not only in research but also in education. However, due to the multicultural background and strong research orientations of its new professors, EPFL is currently finalizing such profound mutation, and fully integrating it into a new cultural identity. The latter will be essential, in particular for new educational approaches that have to nurture more and more their roots at the frontiers of research and innovation. Eventually, by deciding an irreversible move towards the adoption of English as the only language to convey knowledge at the master and PhD level, EPFL wants to become not only innovative and multicultural, but also definitely open to the world for both education and research.

Missions

Education. It is the primary mission of EPFL. The training of young engineers, scientists and architects aims to enable researchers, leaders and entrepreneurs, so needed by society, to address key challenges. This mission is standardized, at a national and European level, through the Bologna Process, implemented at EPFL in the mid-2000s. Recent reflections on education have helped develop measures going from a strengthening of the technological basis to a coming-together with the world of digitalization, computational thinking, and social sciences, which will be key for future employment and innovation. Eventually, a peculiar attention on the consistency of the curricula and their structuring based on learning outcomes is now performed and has become part of the quality culture within the management of EPFL curricula.

Research. When it comes to research, the overall strategy of EPFL is not rigidly fixed, but is rather carried out through a variety of stimuli, including competitive recruitment in key areas according to its strategic planning. In this scalable and flexible context, several main topics were defined to stimulate initiatives across the institution, such as around the convergence of the "nano - bio - info - cogno" technologies, life sciences and bioengineering, green and sustainable development technologies.

Several initiatives have been launched along the line with a great attention to stimulate synergies between disciplines and encourage thereby transdisciplinarity (see figure 1-2). This is why, for example, the EPFL Energy Center, the Space Center, the EPFL-ECAL Lab (engineering and design), the Center for Neuroprosthesis, Cooperation and Development Center, or the Social Media Center have been created.

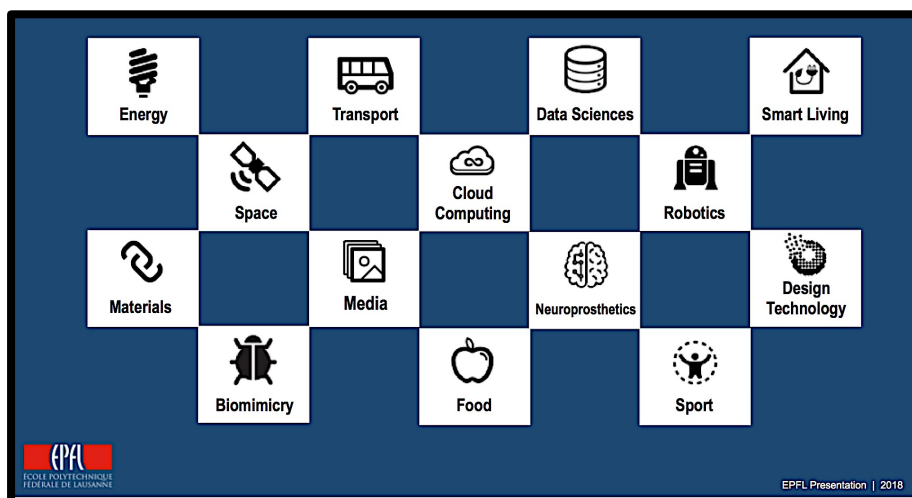


Figure 1-2 Multidisciplinary Research Topics covered by EPFL interdisciplinary Centers/initiatives

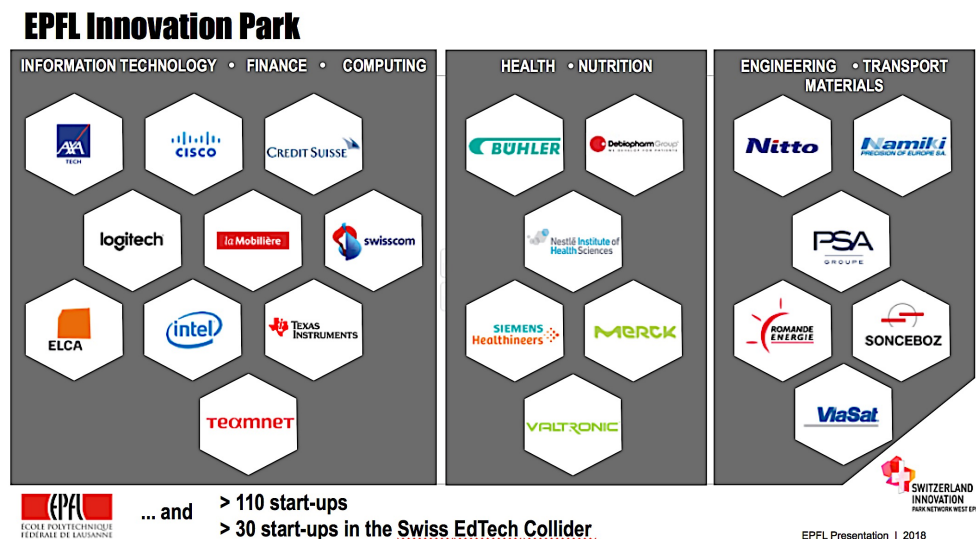
This evolutionary strategy synergizes with more large-scale initiatives at the regional, national level, with examples arising from the [priority projects for 2017-2020 of the ETH domain](#). Those priority programs will concentrate, through the participation to Swiss competency centers, on new approaches to tackle, in a multidisciplinary approach, (scientific, technological, and social approaches) important topics for the future of our society such as:

- energy management (*Energy Research*),
- design of social and economic interaction between people (*Data Science*),
- quality of life of the individual (*Personalized Health and Related Technologies*),
- development of materials with new properties (*Advanced Manufacturing*).

The core technology permitting to address such topics will be the development of performing IT platforms capable of computer-aided analysis of large data records, as well as high-resolution digital images and measurement series from complex processes in the environment, in machines and in buildings, as well as their simulation.

To these initiatives, we can add the *NCCR - National Competence Centers for Research of the Swiss National Fund for Scientific Research*, national programs, such as *Nano-Tera* or *CCMX*, and at an international level, the *Human Brain Project*, the flagship project of the European Union around the simulation of the brain, for which EPFL participates to its leadership. These large-scale-impact approaches results not only in the provision of equipment and technology platforms shared among researchers, but also, in very synergistic actions that can then be conducted by internationally-recognized opinion leaders in the field working cooperatively.

Innovation, development and transfer of technologies represent the third pillar of EPFL. Heterogeneous in terms of their scope and content, activities related to the institutional mission range from simple research contracts to the definition of collaborations and partnerships with both large companies and SMEs. They also involve supporting entrepreneurship and the creation of startups. A privileged receptacle of these activities, the *EPFL Innovation Park* now hosts 22 major companies and more than 110 startups on campus.



Placing EPFL Campus on the map

In geopolitical terms, EPFL campus is close to the European backbone (from the London area, centered along the Rhine, passing from Basel and Zurich to Lombardy), which comprises the productive capacity and wealth of Europe. It is also close to Lyon and Grenoble, regional metropolis. On this solid basis, the aim of the current Presidency is to place, by 2020, EPFL as one among the best technological universities in Europe, and in the world.

According to the priorities decided by its new President, in continuation with the main topics developed previously, the intention is, on the one hand, to endow now, the different disciplines of engineering with the essential core competencies in digital and “big data” sciences, not only for research, but also through education (computational thinking initiative). On the other hand,

the new President has declared his will to govern the main actions of EPFL with a strong policy assuring excellence both in the quality of the delivered education (pedagogical innovation, interactive teaching, student-centered approach), and to push research to conduct its actions aiming at the production of reproducible and meaningful data, within the framework of the [“Open Sciences initiative”](#).

EPFL ambition is also to contribute to the emergence of a highly competitive Swiss university system positioned on a global scale, by combining its international culture, its European roots, and its regional and national anchoring to become an original development model.

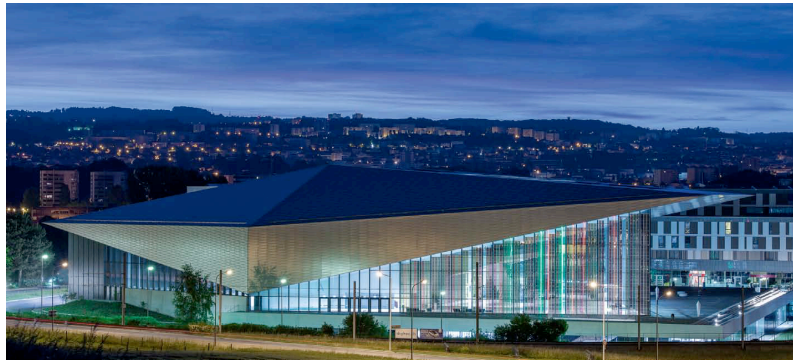
This ambition is concretely reflected in the following objectives:

- become an international technological university of reference when it comes to education, research and innovations, which are meaningful and have positive impact on society;
- be positioned in areas of specific and cross-disciplinary research, in complementarity with specific evolutions in the various disciplines constituting the heart of the school's activities;
- attract the best students and researchers from all backgrounds and nationalities;
- enhance its visibility and international presence.

In order to efficiently contribute to academy, the society, and economy in Switzerland, EPFL, the ETH Board, and Private-Public Partnerships have provided its campus with important facilities. They including the Rolex Learning Center, and more recently, the SwissTech Convention Center, the Discovery Learning Lab, and the Artlab buildings. Those instruments will permit to foster the desired new culture underlying the future endeavor of EPFL community and its partner institutions and industries.

Moreover, the new regional extensions of EPFL Campus confers to it a new “Urban design” that should be understood as an “expanded campus” with maximal travel times of about one hour to join the Ecublens central site from any peripheral antenna. Moreover with the its campus in Ras Al Khaima in the United Arabic Emirates, and its educational commitment with the MOOCs for Africa, EPFL is now ready to push forward its action with a strong commitment for education, research, and TechTransfer positioned at a local and international level.

NEW BUILDINGS



[Figure 1a: EPFL SwissTech Convention Center, since April 2014](#)



[Figure 1b: EPFL Discovery Learning Lab, since May 2016](#)



[Figure 1c: EPFL Artlab, for "Digital Humanities", since November 2016](#)

EPFL ANTENNAS



[Figure 1d: EPFL- MICROCITY in Neuchâtel, since September 2013](#)



[Figure 1f: EPFL Valais/Wallis at ENERGYPOLIS, since March 2015](#)



[Figure 1e: EPFL at Campus Biotech in Geneva, since September 2016](#)



[Figure 1g: EPFL SMART LIVING LAB at Blue Factory, Fribourg since October 2016](#)

A. MISSION AND ORGANIZATION OF THE ENGINEERING SCHOOL

A.1. STRATEGY AND IDENTITY

A 1.1. Identity

[EPFL](#) was created in [1853](#). Foremost an engineering school according to the model of the French "Hautes Ecoles", EPFL currently has the status of a technological university. EPFL is one of the 6 institutions of the [ETH Domain](#), which includes the Swiss institutes and universities for scientific and technological research:

- [ETH Zürich](#);
- [Paul Scherrer Institute](#);
- [EMPA](#);
- [WSL](#);
- [EAWAG](#),
- as well as [competence centers](#).

[The Federal Law on the Federal Institutes of Technology \(FIT/ETH Act\)](#) specifies the status, organizational structure and tasks of the ETH Domain. The Federal Council gives a performance mandate to the ETH Domain, based on the Message of the Federal Council related to the promotion of education, research and innovation. A federal body, the ETH-Board, strategically manages the ETH domain.

Status and legal framework of EPFL

By law, EPFL is an autonomous public-law institution and has the power to establish and enforce its [own ordinances and regulations](#). The main legal foundations are:

At the ETH Domain level:

- [Federal Act](#) of October 4, 1991 on the Federal Institutes of Technology (FIT/ETH Act);
- [Ordinance](#) of November 19, 2003 on the ETH domain (Ordinance on the ETH domain)
- Ordinance of the ETH board of November 13, 2003 on the Federal Institutes of Technology in Zurich and Lausanne, ([Ordinance on ETH and EPFL](#))

At the EPFL level

- [Ordinance of March 1, 2004](#) on the organization the Institute of Technology of Lausanne; EPFL structure is specified in [this document](#);
- [Directive on the EPF School Councils](#) of March 25, 2005 (as of January 2017).

This status allows EPFL to effectively fulfill its mission of education, research and technology transfer contained in the ETH Federal Act.

A 1.2. Policy

The ETH Domain is a cornerstone of scientific research and innovation in Switzerland. In this context, key EPFL activities for the period 2017 to 2020 are mostly included in [the Message on the Promotion of Education, Research and Innovation](#) for the years 2017 to 2020, prepared by the State Secretariat for education, research and innovation ([SEFRI](#)), which, in Chapter 2.4 of the message, sets 10 targets to be achieved by the institutions of the domain.

More specifically, the vision and strategy of the ETH Domain are described in the following documents for the ongoing performance period:

- [Strategic Objectives](#) 2017-2020 of the Federal Council of the ETH Domain;
- [Strategic Plan](#) 2017-2020 of the ETH-Board for the ETH Domain.

and particularly for EPFL, the vision and strategy are divided into:

- The Convention of Objectives¹ 2017-2020 between the ETH-Board and EPFL
- The development plan 2017-2020 for EPFL (Consultation on demand).

EPFL overall vision and strategy is presented in item *1.The Higher Education Institution* of the present self-assessment document.

¹ The convention of objectives is the official document binding EPFL to CEPF, which is based on the goals of the Strategic Objectives. It therefore sets out the objectives that EPFL should achieve during 2017-2020. The development plan is an EPFL document, approved but not co-signed by the CEPF.

Content of the EPFL educational strategy

Teaching is a central mission of EPFL, which in this respect develops a strategy of excellence at all levels of education (first year, bachelor, master, doctoral, continuing education, including for on-line training with MOOCs). For new freshmen, our strategy is to help the EPFL Gymnasium transition through an upgrade course and the development of online materials to permit them to better prepare and/or orient them on the level of requirement in sciences before their coming at EPFL.

Our master programs in engineering have been accredited by the CTI and the AAQ in 2015. In this context, we will constantly improve and adapt the description of engineer, scientist, and architect profiles with consolidated professional standards with their explicit program learning outcomes. Another strategic focus at the bachelor-master level is to reinforce student computational thinking in all training specialties at EPFL, and foster an interdisciplinarity culture through the new Discovery Learning Labs (DLLs), as well as the creation of well selected training programs focus on the needs of the industry.

The Doctoral School will continue its policy to select and train talented PhD students. To this end it will constantly improve its mode of recruitment, mentoring, and training programs. Its current effort concentrate on the different action to improve the introduction of transversal skills in all courses, in giving a pedagogical training to PhD students in view of their involvement in teaching assistantship for lab and exercises, by increasing the international and cross-sectoral exchanges, and the implementation of block courses that may be taken during Summer School programs.

In order to better meet the needs of post-training and continuing education, EPFL is developing an Extension School. It will offer online courses in key areas, and has chosen, as a first step, digital technologies. EPFL's quality assurance system for education is continuing to roll out, ensuring excellence in all of the School's training offerings.

[EPFL National Network and participations](#)

EPFL has close collaborations with the institutions of the ETH domain, particularly through [competence centers](#) of the ETH domain or through joint professors and PhD students of EPFL working in research institutes in the ETH domain. Exchanges of students in the ETH domain are possible and also supported by a specific program currently under discussion.

EPFL participates in inter-university coordination led by the Rectors' Conference of Swiss Universities organized today as the [SWISSUNIVERSITIES](#) office. Among its duties, the entity, which is organized in chambers and delegations, is responsible for the national coordination and monitoring of education in Switzerland.

[Organization of the ETH Domain](#)

The Federal Law on the Federal Institutes of Technology ([FIT Act](#)) specifies the status, organizational structure and tasks of the ETH Domain. The Federal Council gives Strategic Objectives to the ETH Domain, which is based on the Message of the Federal Council related to the promotion of education, research and innovation. The strategic and monitoring body of the ETH Domain is the [ETH Board](#) (anagram in French: CEPF).

The reporting system used by the ETH Board is based on an annual management report and self-assessment reports, which focus on the degree of achievement of the Strategic Objectives and which are presented in the middle and at the end of the performance period (presently 2017-2020); please refer to the ETH-Board website to consult the [key documents](#)^{xxix}. These are subject to approval of the Federal Council and Parliament.

A 1.3 Autonomy

Thanks to the Federal Act on the Federal Institutes of Technology, EPFL has the authority to establish and enforce its own ordinances and regulations (see A 1.1), it has a large degree of autonomy. Thus much room to maneuver is possible when it comes to utilizing its financial (it has its own budget, cf. A 5.3), organizational, academic and personnel management skills. The Presidency determines its own structures, defines its own teaching strategy for curricula and courses.

For example, thanks to its autonomy in organizing and education, the EPFL was able to develop a strategy for the extension of the campus to regional and international institutes, which include the new antennas in:

Ras Al Khaimah (UAE): [EPFL Middle East](#) specializes in energy and sustainability (2004); **Neuchâtel :** Institute of Microtechnology – [Microcity](#), 2013; **Sion :** [EPFL Valais](#) academic cluster on energy, in 2015; **Geneva :** [Biotech Campus](#) dedicated to neuroscience and neuroengineering; and **Fribourg :** [Smart Living Lab](#), dedicated to the habitat of the future.

A.2. TRAINING POLICY

EPFL offers a choice of 24 [Master](#) programs.

A. 2.1. Education policy for the bachelor and master programs

The EPFL management, mainly the Vice-president for Education with the help of the conference of the directors of programs, and the Educational Affairs, provides the overall cohesion of the trainings, and gives them an identity of the highest level. Its policy is a balanced education between universality and depth. The goal is a strong scientific education promoting computational thinking, technological mastery, oriented towards problem-solving capacity with openness and flexibility that confers to students competencies for project design, management, innovation, and entrepreneurship. The humanities and social sciences are integrated into all bachelor and master programs; the master program are responsible for the introduction to research and innovation. At the master level, the pedagogical approach is designed to encourage research and innovation through the active participation of students, particularly in projects developed in the new Discovery Learning Lab, and in Faculty's research labs, and during their Master thesis or internships in industry.

The implementation of the Bologna process is defined by the [Ordinance on the bachelor and master programs at EPFL. This text defines the structure of](#) the education, the principles of evaluation of knowledge, the conditions for obtaining degrees, etc.

The range of fields taught at EPFL is the result of a constant observation of the main sectors of activities of engineers, scientists and architects. There is no current intention from our Institution to increase much further the offer of EPFL's master programs; indeed their design makes it possible to customize them, and adapt the curricula in a very flexible manner with minors and specializations (see the structure of the studies below).

A. 2.2. Organization

The organization and management of the studies are treated in details in A.3.4.

A. 2.3. Admission requirements (*see also Chapter D*)

[Admission](#) to a bachelor program requires a cantonal or federal high school (“maturité fédérale”) certificate or equivalent degree (i.e. a French bac in sciences with scores in math, physics equal or above 16/20). For the other degrees, a specialized education program of one year, the Special Mathematics Course (CMS), enables Swiss applicants to acquire the required admission level. Admission to the master programs requires having obtained the bachelor degree (see [admission requirements](#)).

A. 2.4. Structure of the studies

The curricula of bachelor and master programs are structured according to the ordinance cited above:

- **Bachelor:** the students are enrolled in one of 13 sections delivering a bachelor program; however some flexibility to change sections and to join another bachelor cycle in an adjacent field does exists, at least after the propaedeutic first year.

In 2016, EPFL restructured the first-year curriculum in an effort to reduce the number of required courses. The following improvements were expected. First, it could strengthen the core technical curriculum, which is based on a solid mastery of basic sciences. EPFL consider this as the foundation upon which our degree programs are built. Students may, in this case, dispose of additional time to learn those key concepts more thoroughly, and to develop their autonomous work habits. In addition, a significant portion of the study plan will be devoted to subjects in the students' respective section, giving them more exposure to their main course of study.

Moreover, a new regulation was introduced for the [control of studies and examinations at EPFL](#). Indeed, the transition from gymnasium to EPFL was found in recent years to be often difficult for many students (55-65% rate of failure). To support those students in difficulty, having an insufficient level in basic sciences, EPFL has developed a new course (MAN, in French, “Mise À Niveau”). The MAN has, as its main objective, to give an opportunity to fill student gaps in mathematics and physics, and allow them, if successfully passed, to start again the propaedeutic year, to become better-prepared somophores with greater chance to succeed-well their studies at EPFL eventually.

What is the MAN exactly ? During this first propaedeutic year, only students who, at the end of the first semester of the preparatory cycle, and its exam session, have reached a weighted average score of at least 3.50/6.0 for the first block of scientific branches are allowed in the second semester (see

new ordinance mentioned above, Art. 22). Students, who failed, **must follow** during the spring semester the MAN upgrade course. Moreover, the failure to attain an average score of at least 4.0/6.0 at the end of that course, or the failure to comply with the obligation to follow it, is considered as a sufficient reason for their definite exclusion from any EPFL Bachelor's degree courses.

The propaedeutic year is successfully completed by passing exams that assess the learning outcomes of all delivered teachings with an average score of 4.0/6.0 - equivalent to 60 ECTS credits. The required average scores of 4.0 is considered as the minimal level to master in order for students to follow the 2nd year of study successfully. EPFL will evaluate this year (2018) to which extend the MAN was successful in order to give students the required level to pass their 1st year with excellent scores.

The second and third years of study form the [bachelor cycle](#) with 120 ECTS credits. The addition to the 60 credits obtained during the propaedeutic year constitutes the classical cycle for a bachelor degree. This title is considered only as an academic "passport", and not as a professionalizing degree as in the USA. Its main function is to give access to master programs. This generally occurs, at EPFL, in the corresponding branches, but may also permit to join adjacent fields or specialized masters (this is allowed if 80% of corresponding prerequisites have been fulfilled). Furthermore it gives the possibility to students to move in the same field of study in another university (i.e. vertical mobility according to Bologna). During their third year of study, students can spend a year of "outbound" mobility abroad at another university (see the [Guidelines on mobility and the conditions for admission](#) to the master program).

- **Master:** the master programs comprise two successive parts: the master cycle requiring the acquisition of 90 ECTS credits, which is completed by the master thesis (or master project with 30 ECTS), lasting for 4 to 6 months. When successfully completed, these two parts yields the degree of Master, either of Science, of Architecture, or the professional designation of engineer specialists.

Many programs offer [minors or specializations](#) of 30 ECTS credits during their master cycle. The *minors* enable to broaden the education to transdisciplinary fields, whereas *specializations* serve essentially to deepen a specific component of the same field of study. The content of the master program, including a minor or specialization, should however not exceed 120 credits (see [Directive on master programs and minors at EPFL](#)). The master programs, as well as the minors and specializations, are presented in the part of the self assessment documents dedicated to each of the education sections (a list of them and their contents can be found [here](#)).

Throughout the curriculum, students follow a program in Humanities and Social Sciences (SHS), for which the main objective is to connect their scientific approach to the problems of society. Those transversal courses include environment, management and economy, ethics, religion, philosophy, etc. Their contribution to each engineering program represents a minimum of 14 ECTS. In the first year, a common course has been introduced since 2014 under the title "Global Issues". For the important acquisition of transversal skills, all engineering students must also perform a 2 to 6 month [industry internship](#), mainly in a company ([example of an internship](#) for the programs of the STI School)

A. 2.5. Duration and evaluation of the studies

The duration and evaluation of the studies are governed by the [Ordinance on the bachelor and master programs at EPFL](#) and the [Ordinance on the evaluation of Bachelor and Master studies](#).

For each cycle, the branches are clustered into "groups" or "blocks". In a group, each branch must be successfully completed in order to obtain the corresponding credits. In a block, obtaining a cumulated average grade of 4.0/6.0 can enable acquiring all the credits constituting that block. This block system permits to impose compulsory subjects, but avoids that a branch becomes eliminatory. The Master thesis begins only after successful completion of the master cycle. It ends with a report and an oral defense passed in front of the Msc. thesis advisor, and an expert external to EPFL.

The duration of a study cycle is limited to twice its normal length; this enables students to pursue their training, either at a reduced pace, or to undertake other activities, such as a part times job, to financially support their studies. Cohort studies at EPFL have shown that about 60% of those who graduate from their master program, do so in the minimal required time.

All student activities indicated in the course plan with the ECTS credits are examined, and their scores recorded. Faculties are responsible for the smooth running of educational activities. For each course, the mode of examination is explained in the syllabus. An [Ordinance on study evaluation at EPFL](#) informs teachers about the preparation, organization and conduct of examinations. This Directive also addresses

the problems linked to cheating and plagiarism, and intends to prevent them by asking teachers to speak with students about these issues, and inform them on the disciplinary measures that would be taken in case of practice.

Syllabus (see also chapter C)

Each bachelor and master program offered at EPFL - including minors and specializations - is fully described in its **syllabus available online on the web pages of the responsible section**. In it, each course is presented in terms of targeted competencies, headings of the delivered content, prerequisites, teaching material, teaching activities and exam type. In addition, the syllabus and [related Web pages](#) ensure a full access to all academic regulations, and information to academic or social points of contact, and to the academic management IT-tool [IS-Academia](#). This IT tool, displays, among others, the academic calendar, the dates with classroom and schedule of exams, the grades obtained at exams, and this in a student and program-specific manner with a secured access guaranteed by an obligatory personal code of identification. More details are given about this in the part of the self-assessment document dedicated to the sections, (and under C).

A. 2.6. New Pedagogical initiatives

Besides the recent introduction of the MAN upgrade course, to improve the success rate of students applying to the EPFL propaedeutic year, new pedagogical initiatives were undertaken on our campus ([see EPFL MAGAZINE, N°12, 2017 for an illustrative information](#)) to promote a more “**student-centered**” mode of teaching, including for lab practices, multidisciplinary, and societal issues.

A.2.6.1. [EPFL’s Discovery Learning Lab \(DLL\)](#). Lab Practices in a multidisciplinary contextual organization with a focus on innovation opened to competition

Practical sessions are an essential part of an engineer’s training, and considered as an educational must at EPFL. By exposing students to the concrete aspects of their fields of study, practices illustrate and reinforce not only theoretical concepts, but also give the opportunity to train students in project design and management, innovation, communication, and critical thinking.

Their main objectives are:

- **Offering up-to-date facilities for practical sessions in modern engineering**
- **Promoting cross-disciplinary dialogue with an *ad hoc* educational support**
- **Fostering ties between students and employers in a societal context**

These platforms offer unprecedented educational possibilities to professors to approach the key issue of conferring multidisciplinary skills to engineering students. Indeed, the increasing complexity of the challenges, those future engineers will be confronted with in their professional careers, obviously call for new methods and closer ties between educational disciplines.

Such facilities are run in close partnership with existing professional facilities on campus, in which the most complex tasks can be carried out. Thus, by pooling resources and building “*shared teaching facilities*”, it becomes possible to offer practical sessions within a given frame assuring internal consistency and continuity for the projects in progress. This contributes to fostering the acquisition of transversal skills (communication, transdisciplinary thinking and innovation), which are made possible by involving students with different backgrounds.

With these objectives in mind, the Discovery Learning Laboratories (DLL) are dedicated, thematic spaces for practical lab sessions that are open to all sections that would like to integrate them into their curriculum. They are especially adapted for teaching to large groups of students, generally at the undergraduate level. To this end **prototyping facilities** were built to train EPFL students in the fabrication of components for the interdisciplinary projects they have selected to participate to. In those sessions, students benefit from a **professional supervision performed by qualified tutors**, and modern fabrication tools. Concerning [interdisciplinary projects](#), they are applied research projects that may give rise to the participation to compete, not only to national challenges, but also to **international competitions**, to which Master’s students can apply. The current projects available to students at EPFL today are:

“Robotics contest” at EPFL’s. The contest is carried out as a semester project for Master’s students in the School of Engineering (STI). It lets five teams of three students go up against each other, and test their ingenuity in a friendly competition. Each team starts with the same set of components to find the best solution to a specific challenge. The project gives students an opportunity to expand and apply their skills in programming, mechanical design, electronics, and construction, on a concrete

task. By working in interdisciplinary teams, they also acquire skills from their teammates and become full-fledged makers, capable of prototyping their own ideas. Equipment and professional supervision are provided.

“Lab in a Tube” competition. Lab in a Tube is an applied research competition for Master’s students in the STI faculty introduced in the programs as a semester project. The objective is, for instance, to miniaturize microsensors and to integrate them into a tube with the diameter of a catheter. The students must adopt a rigorous approach for innovation, which involves studying best practices, design, and the implementation of their innovative solution. They are introduced to work in EPFL’s white room to produce their sensors, and benefit from testing facilities to evaluate their performance. This project gives the students an opportunity to access and learn how to use technologies that are common in the industry, in this case at the interface between engineering and life sciences. Working in multidisciplinary teams, the students are training their capacity to communicate in such context, and develop their critical thinking.

“Hydrocontest”, a world university competition. Students from around the world are presented with this challenge. Using a given set of pieces, students are asked to build a fast, energy-efficient boat. The first edition of this competition was carried out in 2014, and brought together 14 teams from 7 countries. Hydrocontest aims to familiarize architecture and engineering students with energy-related issues, in particular for maritime applications, inciting them to develop innovative technologies. Entries by the students could eventually feed into the development of commercial and leisure boats at the industrial scale.

“Fly your Project”. Following the spirit that led to the successful launch of [Swiss Cube satellite](#), students are invited to participating in the next adventures in outer space, such as [CubETH](#) and [Clean Space One](#), EPFL’s Space Center regularly offers student projects that they could participate in. Interdisciplinary by nature, these projects give students from across campus an opportunity to apply their knowledge to passionate challenges.

“Monitoring a Building”. The goal of this project is to use a building as a concrete experimental facility, to observe its use and the behavior of its inhabitants in a real-life setting. To achieve this objective, sensors were integrated during the construction of a new building on the EPFL campus. Sensors will allow students to work along two avenues: *a) following users and monitoring structures; b) regulating systems and energy consumption.*

This inherently multidisciplinary project will open the doors to new experiments in fields ranging from energy management and structural mechanics to flow studies, video imaging, and big data management. The inauguration of the first test building is scheduled for 2016.

The “Swiss Living Challenge” *The Solar Decathlon* is an international competition organized in the USA. In order to win, students from universities around the globe have to design and build the best life-size scale, fully operational, solar-powered pavilion. The Solar Decathlon is currently the most comprehensive competition about human habitat, as it involves urban planning, architecture, technology, social uses and affordability of a housing project located in a dense urban environment. It serves, in a way, as the Olympics of Architecture and Engineering for Sustainable Cities, and Green Buildings. The project is profoundly interdisciplinary since it involved also students from different universities that are associated to EPFL in this competition: the **School of Engineering and Architecture of Fribourg (HEIA-FR)**, the **Geneva University of Art and Design (HEAD)**, and the **University of Fribourg (UNIFR)**.

The team defending the “Swiss Living Challenge” won this prestigious international competition in [2017 in Denver, Colorado, USA](#).

“China Hardware Innovation Camp” (CHIC). Organized by the College of Humanities, the China Hardware Innovation Camp (CHIC) brings together students from EPFL and partner institutions: **écal** (Cantonal School of Art and Design, Lausanne), and **University of Lausanne** (School of Business and Information Systems). Teams of 5-6 students develop a connected device from scratch, and manufacture them in small batches.

After designing a novel prototype in Lausanne during the Spring semester, teams fly out to China (Hong Kong and Shenzhen) to finalize the devices at a local prototype’s factory (Seedstudio). In parallel, students have the opportunity to visit some of the leading hardware companies in the region (e.g., Huawei, DJI). They will also pitch their products in front of incubators, accelerators, and Chinese product manufacturers. CHIC gives students a quasi-integral view of what it takes a product

from idea to market in a global perspective.

“Bio-Inspired Food Challenge”. Organized by the Institute of Materials Sciences, the bio-inspired Food Challenge involves different Engineering Schools on EPFL campus. In order to feed 9 billion people by 2050 we need to start thinking differently about food and reimagine the way we produce, process and supply nutrients and how we deal with waste. The project focuses on 2 main topics: a) How does nature protect from damage -> New ways of preserving foods; b) How does nature optimize energy -> Optimal and energy efficient distribution and supply.

We propose to tackle these issues by using Biomimicry approach as innovative problem solving tool. Biomimicry is a way of thinking and problem solving that looks at how a given problem has already been solved in nature. The goal of this challenge is to give students the opportunity to tackle important human challenges by using creative problem solving and Nature as a library of knowledge.

A.2.6.2 “XGrant”. Launched in October 2017, the XGrant program encourages and supports EPFL bachelor and master students' entrepreneurial drive by introducing them on how to turn one's own project into a start-up. What does this initiative offer ?

- An awards up to CHFrs 10'000 to successful applications
- Workshops
- Immersive trips to Berlin and Sand Francisco
- Business information and management guidance

To apply, students need to be EPFL Bachelor or Master students. Students should send a form with their idea, and request a preliminary meeting with the **Xgrant** committee. After meeting and pitching their project, they may be admitted, and sign a contract with a strong commitment to their project. Application and meetings with the committee take place every first week of the month. The new applications and organization of preliminary meeting should be requested two weeks prior to the beginning of the month.

The main spirit is : ***“It is not only about ideas. It is about training students to make ideas happen”***. The main domains of interest are: a) Stage of the project; b) Entrepreneurial drive; c) Team building and spirit

A.2.6.3. EPFL's Massive Open Online Courses (MOOCs)

We believe that the successful university of tomorrow will be not only innovative and open to the world, but also committed to diffuse its knowledge there where it will have the larger impact on society, starting with its own students. EPFL has committed itself to develop Massive Open Online Courses (MOOCs) since they offer a relevant way to efficiently proceed in such direction.

This move for universities will be, however, both an opportunity and a challenge. There is no doubt for those who have been involved in the generation of open online courses, that it represents a unique chance to rethink the development of new paradigms in education, and force the teachers to replace ***students at the center of their reflections***. Important questions immediately arise such as, how to efficiently transmit knowledge in that way - how to challenge the curiosity of students or their adaptability to this new media - how to foster their capacity of self motivation and autonomy, permitting them to actively interact with a digitalized teacher, and, above all, **to learn**.

Therefore, although we also shear the view that online courses are not “a fit to all solution”, as expressed both by teachers and students, we must admit that the gathered experience with them at EPFL have convinced us that digital education can undoubtedly become a fantastic tool for student success, if used adequately, in particular for some disciplines.

The 2018 vision and strategy of EPFL on MOOCs can be summarized as follows, both in terms of new paradigms in education, and main target populations:

- A) MOOCs are imposing themselves as a relevant pedagogical tools including for regular courses delivered on our campus. Experimental classes have been followed up as pedagogical research projects under the supervision of the VPE and the **Teaching Support Center (CAPE)**. Based on the accumulated experience, teachers are now better grasping which is the best way, i.e. as stand alone, or in mix (**flipped classes**), to tailor them according to topics, disciplines and/or context, for the successful learning of students.
- B) They definitely offer a unique pedagogical vector to reach and disseminate knowledge in developing countries, as it is the case of **MOOCs for Africa**.

- C) MOOCs appear undoubtedly as a true opportunity **for continuous education to tackle the challenge of digitalization and transformation of our society and global economy.**

Along this line, in 2017, the [Extension School at EPFL](#) was created to actively participate to the transformation of our society. To this end a specific emphasis was put on **“numerization and the digital world”** using MOOCs as a distance-learning tool for continuous education. The courses and programs are designed to get learners on the path from digital literacy, to competency, to mastery - no matter their starting point. The courses and programs are now open for enrollment for anyone, with no educational pre-requisites whatsoever.

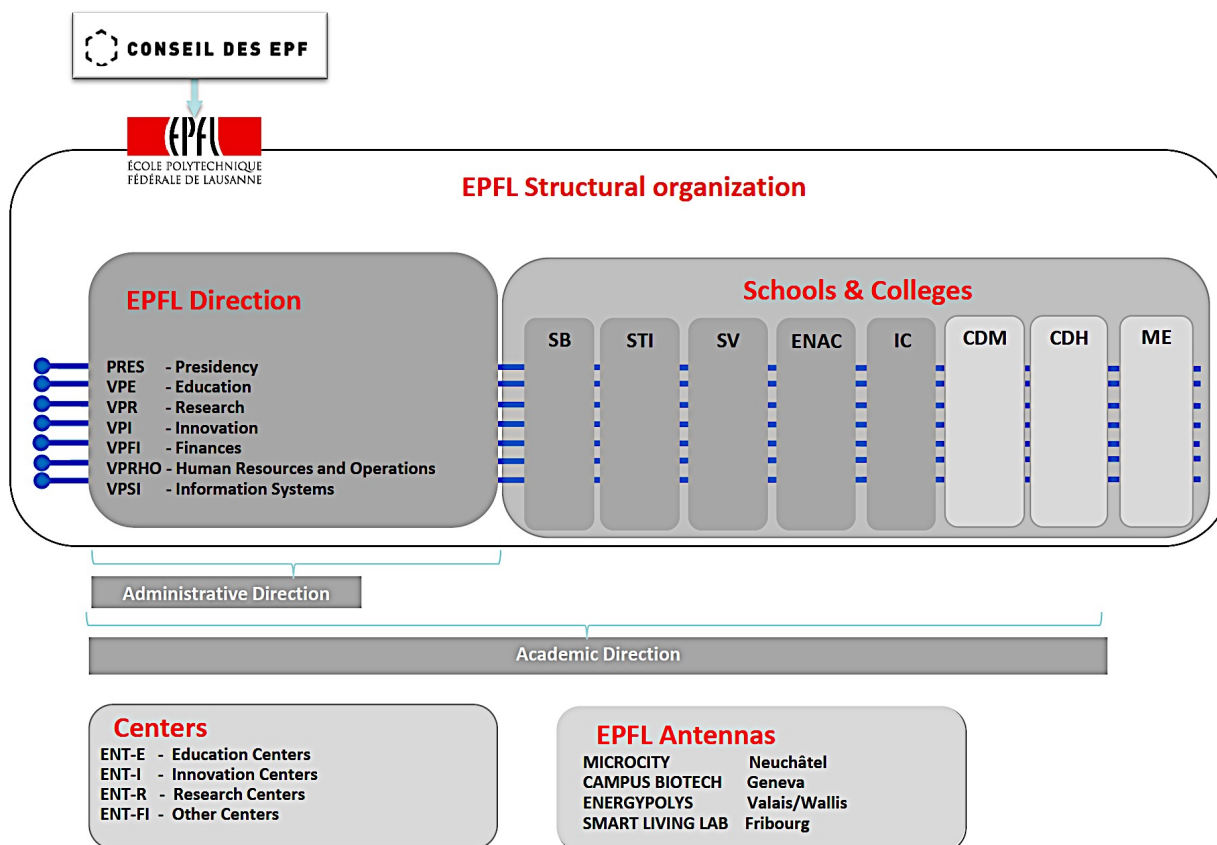
The Extension school has the ambition to deliver high quality course levels proper to EPFL standards for education. Such on-line courses, however, will require commitment and effort from learners to succeed. Direct instructor contacts and support will be offered so that participants can ask questions, get clarification, and improve their comprehension as they work through the course materials. The underlying goal is to give learners the resources they need to successfully complete each course.

A.3. ORGANISATIONAL STRUCTURE AND MANAGEMENT

The Ecole polytechnique fédérale de Lausanne (EPFL) headquarters is in Ecublens (Vaud). Its structure and management is defined in a [specific ordinance](#), which also includes the organisation and decision-making powers of its Direction.

Any changes in the organisational structure of EPFL are subject to a decision made by the EPFL Direction after consultation of the School Assembly. EPFL is structured into a Directorate, Schools and Colleges, a School Assembly, a Conference of the faculty, centers, and central bodies. For synoptic views of the EPFL perimeter and organisation, please consult the [Polylex EPFL data base](#)

Organisation EPFL 2017



A 3.1 EPFL Direction

It is composed of the following members:

- the President ;
- the Vice President for Education (VPE);
- the Vice President for Research (RVP);
- the Vice President for Innovation (VPI);
- the Vice President for Finance (VPFI / CFO);
- the Vice President for Human Resources and Operations (VPRHO / COO);
- the Vice President for Information Systems (VPSI / CIO).

The President appoints *his deputy* from the Academic Vice-Presidents. The EPFL Direction can appoint a *General Secretary* who coordinates the activities of the Directorate, as well as a *General Counsel* who heads the Legal Department. They take part in the sessions of the EPFL Direction in an advisory capacity.

The EPFL President is also assisted in his task by [different offices](#): a **Development Office**, an Office for **Faculty Affairs**, an Office for **Governmental Affairs**, and a recently re-constituted Office for **International Affairs**.

A.3.2. Managerial structure of the EPFL:

EPFL is led by a Presidency, which also takes into account numerous consultations of internal and external stakeholders. The management of EPFL has a large level of autonomy defined in related [legal documents](#). Thus the presidency has the possibility to organize itself according to its managerial needs. Since a new Presidency has started in January 2017, the organizational chart of EPFL has changed including for its Senior Management. The current one is summarized as follows and in the joined figures.

The EPFL Direction:

- appoints the other members of the Faculty Direction according to the defined procedure;
- adopts the faculty regulations, notably on the proposal of the deans of faculty. This proposal must be approved by the Faculty Council;
- approves, in particular on the proposal of the dean(s) of School(s) or College(s) concerned, the creation or removal of institutes, laboratories, chairs, or centers, and of academic curricula;
- makes the decisions as an employer for EPFL staff;
- ensures the participation of the social partners within the units for all general staff-related issues;
- is responsible for safety and health at work;
- ensures the general communication of the EPFL;
- appoints the section directors on the proposal of the dean of faculty concerned;
- is responsible for risk management and internal control;
- **sets up a quality assurance system;**
- can constitute a Strategic Committee and a Scientific Council;
- is responsible for the cantonal offices of EPFL (Neuchâtel, Geneva, Valais, Fribourg).
- conducts regular meetings with the School Assembly and the Faculty Conference.
- delegates one of its members to meetings with the School Assembly at each of its sessions and with the Faculty Conference at regular intervals.

The EPFL President (P): Professor Martin VETTERLI

The president is the President of the EPFL Direction. He assumes overall responsibility for EPFL and is answerable for his management to the ETH Board. In addition he:

- allocates to the members of the Direction of the EPFL and to the deans of Schools and Colleges the means envisaged within the budget. He appoints the deans of Schools and Directors of Colleges.
- prepares, in agreement with the Deans of Schools or Directors of Colleges, the appointment of their ordinary, associates, assistants, tenure track assistants, and adjunct professors. He similarly appoints the senior scientists and lecturers of the concerned Schools or Colleges, and awards academic titles to members of the intermediate academic body.
- is responsible for Faculty Affairs, and the Art-Science Office, and for the management of the cantonal branch of EPFL in Geneva.

Vice President for Education (VPE) : Professor Pierre VANDERGHEYNST

The Vice President for Education coordinates teaching as well as training at all levels (Bachelor, Master, Doctoral, Postgraduate and Continuing Education). In addition he:

- allocates resources for education as part of its budget allocations.
- defines the contribution to the teaching of new teachers.
- It promotes safety and health in training activities.

Vice President for Research (VPR) : Professor Andres MORTENSEN

The Vice President for Research is responsible for the allocation of resources for research in the context

of its budget allocations and supports EPFL research activities. He is the Deputy of the President of EPFL.

In addition he:

- negotiates the installation of new teachers.
- supports and promotes the exploitation of research results, particularly through the transfer of knowledge and technologies, as well as collaborations with industry, the economy and public entities.
- Is responsible for scientific documentation and libraries.
- promotes safety and health in research activities.
- Is responsible of technological and scientific platforms.

Vice President for Innovation (VPI) : Professor Marc GRUBER

The Vice President for Innovation promotes and develops the relationship between research, the economy (including entrepreneurship) and society. In addition he:

- is responsible for the promotion and development of the EPFL Innovation Park, and the Scientific Innovation Park WEST EPFL association; he supervises the “EPFL Foundation Innovation Park (FEIP), The “Société simple du Quartier de l’Innovation (SQIE), the “Garage” and the “Forge” incubator structures.
- allocates resources as part of its budget allocations.

Vice President Finance (VPFI / CFO) : Madame Caroline KUYPER

The Vice President for Finances manages and plans the resources allocated to teaching, research, innovation and services. She is responsible for financial management and bookkeeping in accordance with the rules issued by the ETH Board. In addition she:

- is responsible for the EPFL budgetary planning.
- attributes resources within the framework of budgetary allocations.
- manages risks at an institutional level.

Vice President for Human Resources and Operations (VPRHO) : Dr Etienne MARCLAY

The VPRHO is responsible of human resources and health and safety in the workplace, as well as health promotion (for students and staff members). In addition he manages :

- the creation and maintenance of the value of mobile and fixed assets and ensuring their efficient and appropriate usage.
- the purchase of goods and services and the inventory.
- the development of processes as well as management and support tools for resources and infrastructure.
- the other EPFL campuses (EPFL antennas, except Geneva).

Five Schools and two Colleges:

- School of Architecture, Civil and Environmental Engineering ([ENAC](#)),
- School of Basic Sciences (FSB),
- School of Computer and Communication Sciences ([IC](#)),
- School of Engineering,
- School of Life Sciences (SV);
- College of Humanities (CDH).
- College of Management (CDM),

The organizational regulations of each School and College are [listed](#). These bodies have the following characteristics:

- A Dean or a Director who has significant autonomy in personal, financial but also organizational management, heads each School or College respectively.
- **The School also has its own management committee**, which is its executive body. The Director(s) of the teaching programs is(are) often included in the management committee of the School (or college), with the directors of the institutes.

- **The other key organism of the School is the School Council**, the competences of which are described in the [Directive on School Councils](#).
- **Schools and Colleges include institutes** that are generally disciplinary (bringing together Chairs and laboratories), general services, as well as technical centers and platforms.
- **The Schools also have ad-hoc committees** such as bachelor/master teaching commissions, academic commissions (review of curricula and courses for the bachelor/master programs), doctoral and research program commissions, promotion commission, recruitment commission but also security and IT commission, without forgetting the advisory committees. Some Schools also have scientific and industrial advisory boards, which can also function as an advisory committee for the bachelor and master education.

A.3.3 Governance

Leading the Technological University

Executive sessions: Executive sessions at EPFL, held once a week, include the President, Vice- Presidents and the Secretary General, the EPFL Head of communication, and EPFL's General Counsel. Formal decisions like budget allocations and faculty recruitments, education programs are typically discussed and approved during these senior management meetings. Several reporting and strategic reports support these decisions. At regular intervals, the Delegate for QMS is invited to present cases, but also to discuss specific points related to quality Assurance with the members of EPFL Senior management concerning accreditation, and evaluation procedures according to the MS of the ETH domain, and their follow-up.

Interfacing with School Deans: D2 Directory meeting: Sessions for sounding out, discussing strategy and key developments of the EPFL are held twice a month between the EPFL Senior management and the School Deans as well as the College Directors. Bilateral discussions on more operational issues (such as infrastructure and "heavy" equipment, budget, space planning) are also conducted regularly with each School Dean in the presence of the VPRHO, and of the General Counsel.

Management of current affairs and general coordination: EPFL current activities are reviewed and followed up on a weekly basis in more informal ad-hoc meetings by the Secretary General and the Deputies of the other VP, or invited Deputies representing specific Schools, or heads of central offices or infrastructures.

VP Management: Within each Vice-presidency, a meeting comprising the Heads of the various central offices and related peripheral services is held on a regular basis to prepare objects to be presented at the Presidency directory board meetings, develop and discuss pending cases, and exchange information. Numerous bilateral meetings can be also held between the VPs and their respective deputy and direct staff, and the directors of units that depend from them.

Consultation bodies. For its governance EPFL has regular consultations with the [ETH Board](#), which comprises members of academia, a representative of the School Assembly of the two ETHs, and representatives of private economy ([list of the members of ETH-Board](#)). It is noteworthy that the ETH Board itself gathers thereby the opinions of EPFL assembly before the EPFL Senior Management makes major decisions concerning general interests of the institution.

Consultations with internal stakeholders participate at several levels:

- a) In [the Senior management of EPFL](#), which has its own advisory board (a sounding board for the EPFL presidency).
- b) the [EPFL Assembly \(AE\)](#) representing all bodies of the institution is the main internal consultation body for EPFL's senior management. AE consists of 16 members elected to each of the four bodies of the institution: students, teachers, scientific collaborators, and members of the administrative and technical body.
- c) By the EPFL Senior management being attentive to the opinions of Deans of Schools and Directors of Colleges that they meet twice monthly in so-called D2 meetings.

- d) By the EPFL Senior Management organizing biannual meetings with students:
 - EPFL Senior management and the board of [AGEPOLY](#) (EPFL students association).
 - EPFL Senior management and student representatives (Forum discussion with Q/A with Class delegates).
- e) By the [Vice-presidency for Education](#) being close to Program Directors during the CDS meetings, and to students, together with the EPFL Director of Educational Affairs who collects suggestions and grievances through sessions held monthly with the [EPFL student Association, AGEPOLY](#). The Director of [educational affairs](#), also in charge of student associations, meets also regularly their head and committees.
- f) Moreover, Schools have their own consultation bodies, the School Council, and many have scientific or industrial advisory boards.
- g) In the Program Directions (in French: sections):
 - They have evidence as well as key elements of the employability of alumni having just graduated from EPFL ([annual employability survey](#) performed by the Career Center and by the direction of each program by a direct survey of their own Alumni).
 - During each School evaluation, a survey of the alumni who graduated from their programs is carried out.
 - The voice of the students is heard through class representatives and student representatives of the teaching commission (in French: Commission de section).
 - The voice of the world of employment is heard by consulting the advisory committee (in French: comité aviséur).
 - By consulting the feedbacks of the employer in the internship report of students.
- h) By satisfaction surveys of EPFL students, PhD students at EPFL and EPFL collaborators.
- i) By contacts between EPFL and the high schools in the French-speaking cantons, the cantonal departments of education, as well as prospective students of the institute of technology through the [Study Programs Promotion Service](#), included in the EPFL Education Affairs.

In **Summary**, the organizational structure put in place thus allows for efficient management, both prospective and responsive, representing a broad participation pursuing with flexibility not only the many missions assigned by the ETH Act, but also able to react quickly to unexpected internal or external challenges and opportunities.

To diffuse the values governing EPF and to facilitate the understanding of the rules and good practices in the management of our institution, the General Council of the Presidency has recently published (2017) a [“Compliance Guide”](#), which recapitulates in a practical way, and simple terminology, the major regulations of our organization. It serves as a reference for **all members of the EPFL** community, enabling them to carry out their work with confidence, fully aware of our school’s guiding principles, how to apply them and whom to contact in the case of specific questions.

A 3.4 Management of education

The management of Education at EPFL and for its teaching programs is involving different bodies that are subject to a set of regulatory texts. In addition, each program, according to the discipline taught, may have its specific rules for the regulation of its study plan, as presented on its [website](#).

The bodies in charge of the management of education and its programmes at EPFL are:

- [The Vice-president for Education \(positioning, mission and projects\)](#), with the support of the Conference of Directors of Programs (CDS), is in charge of the overall coordination of the bachelor/master programs, and runs its operational aspects. He also develops projects for educational reforms with the help of the CDS and the [Teaching Support Center](#) (CAPE). Moreover, he annually presents the training programs, previously discussed at the CDS, for their consistency with the educational policy and objectives of the EPFL Presidency. He implements them after validation by the EPFL Senior Management in the presence of the School Deans.
- [The School and College Directions](#) also play a key role in the development and improvement of education.

They are responsible to :

- propose to the EPFL management the study plans submitted by the section directors
 - propose to the EPFL management the regulations for the application of the control of the studies submitted by the sections of the Faculty
 - assign teaching tasks according to the proposal made by section directors
 - evaluate the participation of institutes and / or laboratories in teaching
 - propose to the EPFL management the creation and the abolition of diplomas and doctoral and postgraduate programs within the Faculty
- **Program Directors designed by School or College directions.** They are supported in their action by a deputy (an adjunct), and are responsible for the coherence, quality and specificity of the section's curriculum. They manage all the academic questions related to their section. They sit in the Conference of Section Directors of EPFL.

They are responsible to:

- orient and advise students
 - designate study advisors from among the teachers of the section
 - to set, in agreement with the management of the faculty, the objectives to be attained for the teaching missions of the section
 - ask School or College management for the human, financial and logistical resources necessary to ensure the quality of the teaching activities of their section
 - manage the budget of the section
 - ensure relations with the various professional circles concerned, including alumni
 - promote the section inside and outside the EPFL as part of a coordinated action with the Direction of their School or Colleges, and the EPFL Direction
 - transmit to the School's or College's direction, the study plan of its section and the regulations for the application of the control of the studies, for approval and submission to the management of EPFL
 - organize the *teaching commission*, the *academic commission*, and the advisory committee.
 - Integrate, in the improvement of the curriculum, the evaluations made by the above-mentioned committee, the peer reviews following School or College evaluations and programme accreditation, and those done on an annual basis (one/semester) by their students
- **The teaching committees**, in addition to advice the Section Directors, the teaching committees have the following competencies:
 - propose study plans and study control regulations for their respective sections.
 - evaluate the implementation of study plans and the control of studies and propose improvements or adaptations.
 - coordinate their activities among themselves within the Faculty, through their presidents. They can create a coordination group.
 - regulate common questions related to the courses of the programme.
 - give their opinion to the Direction of the School or College on all matters relating to teaching..
 - meet at least once every six months, when convened by their chairman or at the request of three of their members. The convocation is sent at least 10 days before the date of the meeting with, in principle, the agenda. The decisions are taken by a simple majority of the members present.

The teaching committees are composed of members belonging to their corresponding section, namely: the Director of the Section, who chairs it; teachers' representatives; representatives of the intermediate corps; student representatives.

With the exception of the Section Director, who is appointed by the EPFL President on the proposal made by the Direction of its School or College, the members of the teaching committees are appointed by the School or College board on the proposal of the respective groups of persons and after approval by the Faculty Council. The term of office is for two years, except for students, which

is of one year only. These mandates are renewable. For specific advisory purpose, the Program Director and his teaching commission count with other bodies or persons or strategic and pedagogical support:

- **The section advisory committee**, composed of representatives of the industry, reflects the needs of employers. It helps to define the main directions of evolution according to requirements and evolution of the job market.
 - **The section academic committee** is responsible for verifying the quality of courses and their assessments, thereby ensuring that the learning objectives are achieved. It usually contains an external expert, e.g. from ETH Zurich, together with well-established professors of the program.
 - **The course evaluations by students**, conducted by the **CAPE**, correspond to the student's satisfaction for the learning activities of the curriculum. This activity will be extended in the chapter devoted to quality assurance of education.
- **The conference of the Directors of Programs CDS** is organized as follows:

CDS is developing proposals for educational improvements for the EPFL Direction. It pronounces on the issues and teaching strategies at the EPFL and takes a position in the consultation procedures, especially those relating to the study plans, the control of knowledge, the evaluation of teaching, internships and student exchanges. It proposes any useful measure with a view to coordinating the training activities of the sections. But it should be remembered that it is the EPFL Senior Management that officially adopts the new curricula and regulations that are submitted.

CDS meets 6 to 10 times a year according to a schedule communicated by the President at the beginning of the academic year. The Chairman may, however, call CDS for an extraordinary meeting. The agenda of the meeting, accompanied by the convocation, is sent to the members at least 5 days in advance. Minutes of the meeting are drawn up and made available to any interested EPFL member. It is submitted to CDS for approval at the next meeting.

The members of the Conference of Section Directors are:

- the Vice President for Education, who is the President;
- the Vice President for Research (permanently invited);
- Deputy Vice-President for Education (alternate to the President);
- Section Directors (13);
- the Director of the Special Mathematics Course (CMS and MAN);
- two students, appointed by the EPFL student association, AGEPOLY;
- the Director of Educational Affairs (DAF);
- the Head of the Registrar's Office, who provides the secretariat;
- a lawyer from the DAF.
- Others specific stakeholders can be invited in the CDS according to the topics covered.

The Vice-President for Education (VPE), acting as the president of CDS assigns to an office to develop and present projects related to the tasks it undertakes. The bureau draws up, for the information of the VPE, the draft agendas and prepares the meetings of the CDS.

This executive office, whose presidency is managed by the Deputy VPE, counts with 1 Program Director per School, 1 representative of the Deputy Program Directors, 1 student, the Director of the Registrar Office with his Deputy who takes the notes.

- The **Council of EPFL Teachers (CCE)**

The Council of EPFL Teachers (CCE) represents all EPFL teachers, according to the by-law 17 of the Statutes of the ETH-Board of November 13 2003. The mission of the CCE is to advise the EPFL management on all questions concerning teaching. The CCE is composed of 25 members (professors, MER and lecturers). Members are elected and sit at the CCE for a two-years period. They can be re-elected no more than twice. The functioning of the CCE is guided by its internal rules.

- The **Educational Affairs (DAF)**,

Led by a Director, it includes units of administrative support to the professors, prospective students, students, and PhD students. The Educational Affairs has established a student desk, with its virtual counterpart that responds to any request.

- The [Registrar's Office](#) (SAC)

Integrated in academic services, it is the administrative department responsible for the management and conservation of student records for bachelor, master, doctorate and continuing training programs. It handles admissions, registration according to school rules, develops course schedules and examinations, and continuously informs students of their rights and academic duties. It is responsible for administrative monitoring of students, recording their performances and granting bachelor and master degrees.

To perform its management tasks, the Registrar's Office has a powerful computer tool, tailored to the EPFL, but now used by many Swiss Institutes of Higher Education, [IS-Academia](#), whose broad features and very extensive management capabilities, has a public and [secure public access](#).

The IT management of IS-Academia is performed by [OGIF](#) ([Organization and IT management of the education](#)) of which one of the subunits sets the indicators of education (published twice a year in a booklet distributed to the EPFL Senior Management, the deans and the programs directors) and uses e-functions of research and statistical analysis available for IS- Academia (statistic example: Annex A3.4-1bis).

A.4. REPUTATION AND COMMUNICATION

A 4.1. Institutional Communication

Over the last ten years, EPFL's reputation has continued to grow, both at a national and international level. The local media are particularly interested in news about our technological University, and references to EPFL appear often in major global publications. This increasing renown is of course essentially due to the excellence of the research undertaken on the campus. However, it is also due to the communication strategy deployed by the School during the past years, which promotes also the attractiveness of the technological university to prospective students, on a national and an international level. Whether targeted toward the EPFL community or the public, the information written and published by EPFL's [Mediacom](#) service is intended to reinforce the core values of the institutional - **innovation, dynamism and excellence**.

Various communication channels, examples of which can be seen on the Mediacom web site, support this objective:

- The EPFL website, the key support of EPFL information and communication; each category of the internal (and external) EPFL stakeholders has its own Internet portal, as can be seen on the banner of the [homepage](#).
- **"The EPFL MAGAZINE"** an internal news journal - is published for the EPFL community every three weeks. It is available free of charge on subscription or from distribution boxes on the campus. It provides a summary of scientific news items written for non-scientists by the Mediacom journalists, and contains many pages dedicated to internal issues. These include academic or cultural events, appointments, profiles, content from students' or staff's associations, and practical information items.
- Targeted e-mails are sent to staff members on an as-needed basis. [An Internal Communications Manager](#) ensures that the right information reaches the right people at the right time.

As for the external public, **which also includes prospectives students** and their families (as well as EPFL collaborators), it's naturally through the media that it remains informed about the activities of EPFL:

- The Mediacom team relies on a broad range of media contacts, including trusted journalists, who process and publish information emanating from the School efficiently and quickly. Whether in the form of [press releases](#), [videos](#), a [media library](#).
- Information posted on specialized sites such as [EurekAlert](#), press conferences, invitations or simply articles published on EPFL's homepage, scientific, event-based and cultural news from EPFL is followed closely by the media, who can rely on our qualified team of [scientific journalists](#) to guide them in their work, provide further explanation or to direct them towards a specialist in their area of interest. A [calendar](#) enables everyone - internal or external - to keep up with forthcoming events on campus.
- EPFL is also present on [social networks](#), including Facebook and Twitter, by publishing research news, a weekly "science question" (Science Q&A), as well as photos from the campus or event-related information.
- The [Mediacom Events](#) team organizes around 800 events each year; for example, visits of federal counselors, well-known personalities, or other universities.
- The [Equal Opportunity Office](#) organizes promotional activities, focused events and specific information for young primary and early secondary schools' pupils (7-13 years old) aiming to promote a greater interest for the studies, career and profession of scientists or engineers in both genders (see also F2.4).

Mediacom has also close contacts with the School and College collaborators in charge of the *press releases* dedicated to scientific achievements, or events occurring in these entities; it is also responsible for monitoring media articles about EPFL and its members. Every day, Mediacom compiles a press review listing references to the School in the general or specialized media. All those belonging to the EPFL community can access the news clippings and audio/video extracts by browsing the dedicated [site](#) or by subscribing to the daily newsletter.

The strategy of bringing together both the internal and external communications operations within the same team, under the responsibility of EPFL management, enables the Federal Institute to effectively monitor the messages going out to the internal and external audiences, and therefore to assure the quality of its communication to the targeted audiences. The gathered spontaneous feedbacks together with surveys, including benchmark with other institutions, show that this communication strategy is bearing fruits.

A 4.2. Communication Dedicated to Prospective Students

To develop synergy, coherence and a greater visibility of the different actions and promotion media for the bachelor, master and doctoral programs, the Study Programs Promotion Service ([SPE](#)), which counts today 8 collaborators, is active since 2012.

The missions of the service are to:

- Develop an overall, consistent study programs promotion strategy (bachelor's, master's and doctoral programs)
- Promote programs internationally, nationally and internally.
- Closely collaborate with all stakeholders, creating a clearly identifiable, harmonized promotional line.
- Promote links and contacts between high school teaching and EPFL teaching

The overall activity of the promotion service can be consulted on the websites indicated in the text below.

Promotional tools and measures managed by the Study Programs Promotion team:

- Creation and management of study programs promotional supports (brochures, multimedia).
- Management of the web portals bachelor.epfl.ch, master.epfl.ch, and phd.epfl.ch and contribution to EPFL's presence on social medias.
- Yearly organization of the [EPFL open days](#) for high-school students.
- Participation to national and international exchange forums.
- Organization of visits and information sessions on campus for high school students in Switzerland and abroad.
- Development of collaborations with key partners (schools, universities, official Swiss representations abroad, etc.).
- Participation in Science promotion events in Switzerland.

A.5. HUMAN AND PHYSICAL RESOURCES

A 5.1 Human Resources

Legal basis

EPFL management of Human resources is based on several legal texts:

- [Federal Act on Employees of the Confederation \(LPers\) of March 24, 2000](#)
- [Framework Ordinance concerning the Federal Act on Employees of the Confederation of December 20, 2000.](#)
- [Ordinance on Employees of the EPF Domain \(OPers-EPF\) of March 15, 2001](#)
- [Ordinance on the faculty corps of the ETH Domain.](#)
- [EPFL Regulation on tenure-track assistant professors \(PATT\).](#)
- [EPFL Regulation on appointing associate professors to full professors.](#)

As well as various other sources, such as Regulation of HR Competences, including the working time regulation, available [here](#) (Polylex EPFL website).

Goals

As part of its performance mandate, EPFL must in the field of human resources satisfy a system of plural objectives determined by the Federal State, the ETH Board and its own development plan. While the Federal State puts a particular emphasis on the flexibility of working conditions, e.g. reconciling work and family life, and a salary system focused on performance, the ETH Domain aims to promote attractive employment and also to ensure diversity (languages, age groups, cultures, gender and social classes) and equal opportunities. Meanwhile, EPFL favors the development of competences and performances in an international environment, promotes the intermediary staff through mobility, renders remuneration flexible and dedicates special attention to the training of its staff as well as to cooperation with the social partners.

Some statistics

[As reported in the 2016 EPFL annual report](#), student numbers at EPFL, including Bsc., Msc., and PhD students, have increased dramatically to pass from 6'336 in 2006, to 10'536 in 2016, which is an exceptional growth. The staff expressed in FTE under EPFL management was 5'443.4 people on Dec. 31, 2016. The distribution in type of staff reveals that 31.1% represents administrative and technical staff, 63.0% research scientists and lecturers, and 5.9% professors (=395). The payroll reached 627 million CHF, remaining proportional to the number of employees. Since 2006, EPFL has successfully integrated various external academic structures, including the Swiss Institute for Experimental Cancer Research (ISREC) and the Institute of Microtechnology in Neuchâtel (IMT-NE), Campus Biotech in Geneva, Energypolis in Valais, and the Smart Living Lab in Fribourg. Due to increased competition in the academic field, the principle of mobility has increased the number of fixed-term contracts. Aligning HR objectives with the objectives and challenges of EPFL enable to move towards the success of innovation, technology transfer and job creation.

Since 2006, EPFL has also continued its strong internationalization, e.g. if we consider the professors of foreign origin, they went from 46% in 2006 to reach 64% today. Due to its rapid internationalization, EPFL was constrained with the obligation to specifically improve the [training program](#) of the EPFL collaborators, with over 35% of its courses for staffs that had to be given in English. To reflect this change, 55 % of the courses concerned subjects are aiming at facilitating local integration, and also at the administrative level.

EPFL Faculty

The EPFL teaching staff include full, associate, tenure-track assistant, assistant, and adjunct professors, teaching Senior scientists and assistants, EPFL Lecturers, “external” Lecturers, excluding PhD students and assistant scientists who are only involved in the supervision of practical work in laboratories or exercise sessions. With these resources and a number of professors close today of three hundred ninety, EPFL is able to provide a quality education at the forefront of research, also using lecturers from the private and public economy, whether due to a temporary course load or by specific interventions in the

courses (conferences, for example; see also specific reports for each section).

Finally, the attribution of faculty positions is based at EPFL on competitive applications evaluated by academic promotion committees operating either at Schools or Central EPFL levels. Accordingly, academic promotion committees are also involved for the promotion, e.g., from associate to full professor. All the search announcements, control of candidate files and application, interview processes and related information is organized by the team of [Faculty Affairs](#), at the EPFL presidency. After acceptance and supportive recommendation of the candidates by the EPFL President, the ETH Board appoints the new positions.

Participation since 2010 in the *Global Report Initiative (GRI)*, has also strengthened control elements related to diversity, education, [promotion of women's careers](#), and [campus sustainability](#). In this respect, the number of woman professors in FTE went from 14.2 in 2006 to 50.5 in 2016. Their proportion of post-doctoral fellows was 28 % on Dec 31, 2016. Regarding the proportion of female managers (equal to or higher than the functional level 10), it has improved from 14.3 % in 2007 to 22% in 2016, which is still insufficient compared to a target of 25 %.

Finally, the proportion of women working 100% increased significantly, from 36% to 69%, during the same period, indicating a significant cultural change related to the increasing demands of the world of research and the enlargement of [child care facilities](#) on campus.

Management and Reporting

Large administrative projects, such as the implementation of the new salary system (NSS) in 2007, the transition to a defined contribution plan in 2008, a system of flat rate salaries for doctoral assistants and post-docs in 2008 and 2010, the computerization of all personnel records in 2012 and, since 2013, the implementation of a management system meeting the requirements of the Confederation but also of European projects, have enabled the development of modern management with an HR performance satisfying the multiple expectations of EPFL employees from more than 120 countries.

These expectations and the changes in the quality of services provided by the EPFL central administration have been monitored with the two satisfaction surveys Atmos I and Atmos II conducted in 2004 and 2012, respectively. Moreover, the overall satisfaction concerning the work situation at EPFL in 2012 amounted to 4.7 out of 6.0, i.e., indicating that 90% of people were satisfied (Atmos II survey).

Furthermore, the development of an annual social report since 2009, a quarterly HR reporting since 2010, a gender report allow a precise monitoring of the various improvement actions undertaken on the basis of satisfaction surveys and multiple HR audits conducted by the Swiss Federal Audit Office, the Inspectorate of the ETH Domain and the European Commission for European projects.

In recent years, in addition to the new Internal Control System (ICS), a culture of [risk management](#) has been developed, thus contributing to different analyses to improve the quality of the HR services, especially regarding the replacement plans for staff and School institutes.

A 5.2 Physical Resources and Facilities

EPFL takes special care of its **campus infrastructure**. The campus is vast and quite new, encompassing 240,000 square meters of floor space of laboratories, offices and classrooms. Classrooms (173 rooms, 17'900 sqm) are geographically distributed close to the various Schools, Colleges and Institutes. Laboratories are specifically equipped for training purposes (175 practical work rooms, 17'700 sqm), and students have access to multiple computer labs. Quality infrastructure for education and training is reflected in the excellent responses obtained from student exit surveys (master and doctoral students), also regarding their opinion about their training, along with those of visiting professors and recent arrivals. EPFL is a living campus, with the recent completion of ample student housing, shops, and a conference center. Construction activities, operation, maintenance and stewardship are all ISO 9001:2008-certified.

The EPFL [Library](#) is the largest scientific and technical library open to the public in Western Switzerland. Located in a building with remarkable architecture (the [Rolex Learning Center](#)), it is a place for work, study and exchanges for students and collaborators of the EPFL's community. It opens 17 hours a day, and 7 days a week. Working closely with the other academic libraries (ETHZ, Universities), the Rolex Learning Center offers a rich collection of books, prints and electronic resources.

The library is leading together with the EPFL Presidency, the transformation of EPFL towards OPEN Science, data management plans, and digitalization of the resources on Campus. The Library is the center of expertise for scientific and technical information, serving teaching and research at EPFL.

The [SwissTech Convention Center](#) is one of the largest conference centers in the Lake Geneva region hosting events of international fame. This majestic building is distinguished by its modernity, and is

innovative technologies. The SwissTech Convention Center (STCC) distinguishes itself from other major congress centers by its number of conference rooms and its adaptable capacity.

The architecture of the building allows three auditoriums to become one; the number of seats in each auditorium can also be changed in just a few minutes. This modularity is based on two mechanisms: a system of sliding walls, and the Gala Venue technology. All this makes of the STCC a wonderful tool for organizing international scientific congresses, or business-related exhibition or conventions in line with the missions of EPFL for research and innovation.



EPFL SwissTech Convention Center opened in 2014

[“The Artlab Building” THREE SPACES UNDER ONE ROOF.](#) The ArtLab building is the culmination of a long-term initiative undertaken by EPFL’s Senior Management and opened in 2016. The overall aim was to revitalize Place Cosandey, a nearly 3-hectare space at the heart of the campus, and turn it into a campus commons. The unifying theme of the ArtLab initiative was to build bridges between **“hard science and the humanities”**, a field for which EPFL already had dedicated a College in collaboration with the neighboring University of Lausanne. The necessity to cross-fertilize technology and social sciences is becoming central today in order to guide new researches and innovations capable to bring a positive impact in a society that suffers from more and more complex and multicultural global issues.

The ArtLab initiatives extend along four axes: a) Encourage the development of new fields of research and training (new Master program) related to the domain of [Digital Humanities](#), particularly in arts and culture; b) Assist in realizing the experimental dimension of exhibition projects linked to artistic and institutional partners; c) Initiate, deliver and evaluate innovative artistic and cultural programs within the ArtLab building, on campus or outside the institution; Promote and ensure successful experiences in direct relationship with the general public and society.

[“The Discovery Learning Lab facilities”\(DLL\).](#) The Discovery Learning Program inaugurated in 2016, was built on, and expands existing structures that promote practical teaching initiatives. It aims at providing a comprehensive platform whose individual parts have to function coherently as a whole. DLL was conceived as interdisciplinary facilities permitting to set up collaborative projects among students from different disciplines of engineering that requires versatile space and equipment. Intended for students, these will include prototyping facilities and project areas, with adequate supervision. Depending on the specific needs they encounter while working on their projects, students will be able to turn to the Discovery Learning Laboratories (DLL), to research laboratories, and to competence centers. (see sub-chapter A.2.6. on pedagogical innovation).

[Resources for Data science](#) has become extremely important internationally, with the majority of top-tier international research and teaching institutions investing significantly in dedicated centers and programs. In this context, EPFL actively participate to the new [ETH Domain’s Initiative for Data Science in Switzerland](#). This Initiative aims to accelerate data science through both an expansion of education and research, and *the provision of infrastructure for data science* users across disciplines. The Initiative creates both Master courses in data science at EPFL and ETH Zurich, and the Swiss Data Science Center (SDSC), Therefore EPFL attaches paramount importance to **information system** resources and **information technology** currently developed under the guidance of the new presidency, and in particular of the VPIS, which is dedicated to managing highly efficient IT strategies and infrastructure (*i.e.* high security and data protection, storage,- plus computation clusters, and access to high performance computers). Various information systems already exist to facilitate the management of research ([Infoscience](#)) and

administration (SAP). Along the initiative mentioned above, new courses will be given to all EPFL students at bachelor level on [“computational thinking”](#). Since particular attention will be devoted to diffuse to all engineering disciplines this field of education, specific facilities with class workstations, and support for the acquisition of personal computers at will be strengthened. An efficient help desk, and a centralized management of IT purchases, ([Poseidon](#)) including laptops and software licenses, already ensure an effective provision of these resources for EPFL students.

[Food services and Restaurants](#). EPFL provides also a large offer of food services and restaurants with diversified menus. (For student accommodation, please refer to C VII).

A 5.3 Finances

The Swiss government allocates an annual budget to the [ETH domain](#), and the [ETH Board](#) divides it between institutions, taking into account the history and performance of each institution (for more details, section [“Points of Reference”](#)). The EPFL’s 2016 **budget allocated by the ETH Board** amounted to 640.83 million CHF, allowed the institution to finance its long-term activities. It is interesting to note here, that **tuition fees** represents a very modest (less than 700 CHF per semester), representing only about 1.5 % of its annual federal budget.

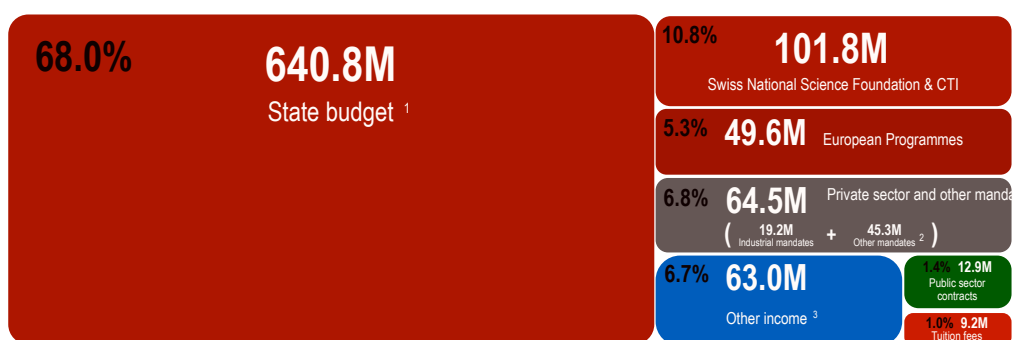
Each laboratory is encouraged to rise **external funding** by filing applications with different organizations to support research: the Swiss National Science Foundation ([SNSF](#)), European research programs, the Commission for the Promotion of Innovation ([Swiss Innovation Agency- Innosuisse](#)), which financially support projects in partnership with private companies. Laboratories also obtain funds by accepting the mandates of public authorities, or private companies. In 2012, an additional 270 million CHF were raised to fund scientific research.

EPFL is also active in attracting **sponsorship**. More than 220 million CHF were raised between 2007 and 2015 for Chairs, projects or buildings. Currently, partial or entire costs for more than thirty Chairs (~10% of the total) are covered by sponsorship (see [sponsored chairs](#) related to sustainable development).

The institution also diversifies its expansion resources by opening **regional institutes** (off-site campus; cf. A 5.2), partially funded by the participating cantons (more than 280 MCHF since 2010), and carries out projects outside its core business (Swiss tech Convention Center, [student housing](#), neighborhood innovation, etc.) through **public-private partnerships** (PPP), of which almost 500 MCHF have been raised since 2006.

In 2016, EPFL’s **total expenditures** (excluding cantonal financing and PPP) amounted to 942.0 million CHF: 66.5 % for personnel costs, 23% for operations and 1.01 % for investments. According to the EPFL analytical accounts, ~30% of resources are devoted to actual teaching (around CHF 26,000 per student), with the rest being used mainly for research (1.8 million CHF per laboratory).

REPARTITION OF THE ANNUAL EPFL BUDGET IN 2016



¹ Including construction expenses

² Not including industry or public sector mandates (foundations, not-for-profit companies, etc.)

³ Overheads, financial revenues (excluding revenues from the DII or technological platforms), designated and reserve funds from private and public sources, congresses and other activities

Additional and detailed financial information can be found on the following information web page:

<https://information.epfl.ch/chiffres>

B EXTERNAL LINKS AND PARTNERSHIPS

B.1. INDUSTRY LINKS

EPFL is attentive to the labor market and the economy; for decades, it has created collaborations with businesses and the world of employment, especially in the context of:

- **Research projects** undertaken with funding from the [Innosuisse, replacing the former Commission for Innovation](#), but also for instance bilateral contracts of a company with an EPFL lab.
- [Sponsored chairs](#).
- **Start-ups, spin-offs, licenses and patents** as well as **companies** operating [in the EPFL Innovation Park](#).
- **Ph.D. thesis**, which results lead to an innovation (patenting and licensing) supported by the [EPFL Technology Transfer Office \(TTO\)](#)
- **Master thesis in Industry** ([see here for example](#)).
- **Student internships in industry** ([see here the central organization of EPFL](#)).
- **Teachings provided by stakeholders from Industry**, either as occasional lectures or seminars, or as full courses (see curriculum of sections).

B.2. RESEARCH AND INNOVATION LINKS

B 2.1 Research Links

EPFL is a Technological (or Technical) University with a remarkable success in research during the past years. Professors, “Maîtres d’enseignement et de recherche” (Lecturer Senior Scientists) and scientific collaborators contribute actively to the EPFL research output. Research at EPFL is simultaneously a top-down and bottom-up process. The main actors and principle drivers of the quality of the research in any competitive research institution are the PIs (Principal Investigators); at EPFL these are mainly the professors. The role of EPFL Senior Management, in addition to that of the EPFL Dean of research, is therefore to define promising research avenues, in particular in interdisciplinary domains in which it is often complex to launch new research directions, but where their developments lead to fruitful scientific results and provide a major source of innovation. One example of this strategy, as part of a new multi-School effort, is in the field of energy that EPFL recently launched in [Valais](#).

The role of the central Research Office consists in organizing the best possible infrastructures and implementing adequate administrative support for our professors and their staff; this support is provided by the [EPFL Research Office](#). This task also includes the elaboration of guidelines and directives enabling to set the proper organizational principles in [all domains](#). Furthermore, EPFL is also active [in ethics and deontology](#); it has determined clear directives on [plagiarism](#), both for students and professors. In addition, the EPFL has developed an instance of [whistleblowing](#).

EPFL Research Competitiveness

In this light, EPFL research evolves in a bottom-up manner and the professors have complete freedom to explore the different parts of their research field. A large part of their research funding comes from external funding bodies, in particular SNSF, the [Swiss National Science Foundation](#) (information on the EPFL projects financed by the SNSF, and EC, the European Commission. It counts also with funds allocates by industry-oriented research, and those coming from established partnerships proceeding from the cantons supporting the regional antennas. (see Figure B2. 1-1, below)

Research contributions, mandates and scientific services					
CHF 1000	2015	2016	of which revenues IPSAS 23	of which revenues IPSAS 9	Deviation
Swiss National Science Foundation (SNSF)	86 790	90 700	90 700	—	3 910
Commission for Technology and Innovation (CTI)	16 828	16 165	16 165	—	—662
Special federal funding of applied research	15 051	15 037	13 183	1 854	—14
EU Framework Programmes for Research and Innovation (FP)	58 419	63 015	63 015	—	4 596
Industry-oriented research (private sector)	39 988	37 394	16 862	20 532	—2 594
Other project-oriented third-party funding (incl. cantons, municipalities, international organisations)	28 388	26 680	24 988	1 691	—1 708
Total research contributions, mandates and scientific services	245 464	248 992	224 914	24 077	3 528
EU Framework Programmes for Research and Innovation (FP)					
of which financed by SERI	2991	7 935	7 935	—	7 935

Figure B2.1-1: Competitive external funding by finding source

The amount of competitive funding that the EPFL professors are able to receive is one of the evidences demonstrating the quality of their research, documented in the EPFL annual report (“Research Indicators and Statistics”) prepared by the EPFL Research Office for the ETH Board and accessible on [the EPFL Website](#). EPFL research competitiveness is also ascertained during the School and College evaluations.

EPFL and Innovation, links with the economy

The aims to link research output and innovation, can be illustrated for instance by the following:

- The European commission launched an ERC sub-program scheme “*proof of concept* with the goal of “bridging the gap between research and a marketable innovation”. EPFL was one of the most successful institutes in this program, which provides evidence of the close connection of fundamental science and innovation at EPFL.
- Tech-transfer activities and interaction with industries, both locally and internationally, are also based on the same principles: a strong central support, and a very large freedom in the choice of possible partners and potential organization of the partnerships. In particular, EPFL has numerous incentives and strong support for the launch of start-up companies.
- Regarding tech-transfer activities and interactions with industries:
 - At the international level, in the last European Framework program FP7, EPFL had 152 collaboration projects with industry. The number of unique industry partners since 2007 adds up to 569.
 - At the national level, the Innosuisse (CTI) grants are significant (contracted values of 16.1 millions CHF in 2016).

These activities are also based on principles similar to those of research: **a strong central support, and a very large freedom in the choice of possible partners and potential organizations of the partnerships.**

Impact of EPFL Research and Innovation on Education

When promoting new faculty members, EPFL makes sure that the future professors are not only key players in their own field, but also willing to contribute significantly to teaching at EPFL, a key issue documented in the promotion file of PATT ([Professor Assistant Tenure Track](#)). Most of the teaching is therefore provided by outstanding scientists and top researchers and, thereby, instill a research-oriented state of mind in students, especially at the master level. Consequently, the curriculum is regularly updated in accordance with new and emerging issues and technologies in the relevant branch of engineering and the students have access to suitable equipment and research facilities. Finally, EPFL is also convinced that the “Innovation mind” needs to be educated and fostered during the studies. This culture of innovation and of a research-oriented state of mind is present not only in courses and seminars, in semester projects realized directly in our research labs, but, **most importantly, in the Master thesis, carried out in EPFL research labs or industry.**

B 2.2 Innovation, Transfer and Entrepreneurship

EPFL capitalizes on its research through an open innovation process and encourages its scientists and students to interact with leading companies. The institution has entrusted interactions with the business community to the Vice Presidency for Innovation ([VPI](#)). The VPI organization offers a set of tools to scientists and students to facilitate interactions with companies. These tools contribute to the transfer of knowledge and technology and boost the innovation capacity. They are used and encouraged by the various VPI service units.

Encouraging Entrepreneurship

As part of its innovation policy, VPI supports entrepreneurship. Firstly, **through seed funding** in the form of [Innogrants](#). Since this tool was initiated already in 2005, 116 Innogrants (11.5 million CHF) have been granted. In addition to these supports to promote new EPFL spinoffs, self-supported companies were created resulting in the launching of 192 companies at the EPFL Scientific Park over the last 12-years period. Secondly, the culture of innovation was fostered mainly through sponsored events, such as innovation camps, conferences, and students exchanges with a targeted audience of students and young entrepreneurs.

VPI contributes to this major issue by attributing, for instance, *Xgrants* to bachelor and master students, by organizing events such as *student-entrepreneurship@epfl*, and participation to meetings such as *The Entrepreneur's Journey*, [Start-up Champions / Venture ideas](#), and group study tours such as the [Silicon Valley Startup Camp](#), [Vleaders in the US](#) and [China](#), and the [Eurotech European Venture Program](#) for EPFL students. This last program is an exchange program between the four university partners of Eurotech, which are Technische Universität München (TUM), Danish Technical University (DTU), Technical University in Eindhoven (TU/e) and Ecole Polytechnique Fédérale de Lausanne (EPFL). It is a unique program organized over 2 weeks in July and August for 5 student entrepreneurs of each university and taking place on all 4 campus.

Start-up Environment

As already mentioned, project implementers, future entrepreneurs and start-ups stemming from EPFL may benefit from various types of infrastructure within the [EPFL Innovation Park](#) such as:

- [La Forge](#), a co-working space, gives aspiring entrepreneurs a place of work, exchange and inspiration to perfect their start-up project.
- [Le Garage](#) - provides premises offering young companies office space for a maximum of 2 years.
- The more mature start-ups, and those collaborating with an EPFL institute or another Swiss University of Applied Sciences, have the opportunity to use modular space with flexible lease conditions and take advantage of various benefits. These premises and related offers are managed by the Foundation associated to the EPFL Innovation Park.

Collaboration with SMEs

EPFL promotes industrial collaborative projects, particularly with SMEs, through its liaison program [Alliance](#), which also involves other Universities of Applied Sciences in the French-speaking Switzerland. The regional authorities provide financial support so as to accelerate technological innovation in local companies. Over the past 12 years, more than a thousand companies have been advised, which has given rise to over 600 technology projects. The Alliance Association brings together more than one hundred companies, which jointly co-finance this program. The Board, chaired by an industry representative, ensures that the program suitably responds to members' needs.

Collaboration with Large Companies and Partnerships

VPI at EPFL offers companies various forms of partnerships. These may range from miscellaneous funding ([endowed Chairs](#), Public Private Partnership infrastructure, course curricula, promotion of science, co-funding a competence center, etc.), to a partnership with a transdisciplinary center, specific research or service contracts, or even installation of a large [company's](#) R&D teams on the EPFL campus, on the "Corporate" premises of the EPFL Innovation Park.

These industry groups interact with the campus in various forms such as research collaborations, hiring engineers, proposing internships, funding and participating in conferences, funding excellence fellowships, or teaching. Above all, they come to the EPFL campus to boost their innovation capacity and recruit promising talents. Concerning partnerships with industry through transdisciplinary centers, the latter bring together several laboratories with complementary skills to collaborate on emerging

themes. The following areas are covered by [33-competency center](#) under either the VPR, the VPE of the VPFI supervision.

Technology Transfer

The Technology Transfer Office ([TTO](#)), which has joined since January 2017 the VPR, is in charge of assessing new inventions, managing intellectual property generated by EPFL labs, approving research contracts with industrial partners, and supporting the creation of start-ups. As part of the TTO, the [ENABLE](#) program finances projects in the short term to accelerate the transfer of inventions by EPFL scientists to the industry. The purpose of the program is prototyping, demonstration of specific applications, and evaluation of pre-industrial feasibility and identification of market opportunities.

B.3. INTERNATIONAL LINKS

In the latest ranking issued by [Times Higher Education](#), EPFL is recognized as one of the most international campus in the world (5th position). Due to its high number of international professors (64%) and its global positioning, EPFL has transformed itself into a truly bilingual technological university, offering an experience in English and French for students originating from over 130 different countries. Over the coming years, EPFL will continue to consolidate its offer aiming at giving students a global experience based on top quality research and teaching:

- *mandatory introductory courses to all EPFL students on [global issues](#) ;*
- *[area and cultural studies](#) and the corresponding minor in area and cultural [studies](#);*
- *internships and stays abroad;*
- *[Strategic partnerships](#) aimed at broadening the scope of research perspectives and international exchanges;*
- *on site and newly extended EPF campus in Western Switzerland and Valais/Wallis;*
- *[online MOOCs courses for Africa](#);*
- *off site campus (abroad) [in Ras al Khaimah, in the UAE](#) for cooperation since 2009.*

B 3.1 Strategy and Communication

EPFL's main strategy is to become a truly **global** university by its 50th anniversary in 2020. This means to be recognized at this time as one among the best technological universities in the world. Although they obviously should be taken with some caution, the current 2017 rankings place EPFL at no. 10 for the Leiden Ranking (in P top1% for physics and engineering) and no. 12 in QS World University Rankings (for Engineering and Technology, 2017). They indicate that the strategy followed by EPFL during the last 15 years to transform the institution, seems to have brought fruits in the right direction for its global recognition. In addition, EPFL aims to also contribute towards the emergence of a new Swiss university system through [Swiss network](#).

The strategy to achieve this goal is summarized in the first chapters of the EPFL development plan 2017-2020 (can be consulted on request during the visit) which outlines the goals for the EPFL management by 2020. EPFL strategy for international collaboration is to bring the current development to maturity, to seize new opportunities to strengthen the influence of the EPFL brand around the world and to benefit Switzerland by focusing on Open Science. In terms of international collaboration, Open Science means more specifically for EPFL to:

- attract the best students, researchers, investors and entrepreneurs to our Swiss campus to increase its critical mass and, consequently, our contribution to innovation and employment.
- radiate globally by becoming one of the leading European universities for education, research, innovation and digital infrastructures (Data & Digital Science) within the frame of the [Swiss Open Science initiative](#).
- federate the international community around our publications, our networks, and our collaborative initiatives (flagships, strategic networks).
- offer our students unique opportunities for international projects and exchanges.
- interact permanently with society and the world (Convergence Art-Science-Society) and use the fiftieth anniversary of the federalization of EPFL (2019).

B 3.2 Organization, Structure and International Internationalization

Since 2011, the members of the EPFL SENIOR management have established a monthly coordination meeting for international affairs. It brings together also School and College deans as well as EPFL officers dealing with international matters. The budgets are directly allocated to the most strategically relevant international projects at the management level.

B 3.3. Partnerships and International Networks

As already mentioned under B.3., EPFL aims to achieve a global presence both through onsite actions (within the on-campus international community and with online MOOCs), and offsite campus by positioning this EPFL global campus as a key player in the fields of science, innovation and urbanism (art-tech-campus).

B.3.3.1. On site

In terms of research, EPFL intends to pursue its development, strengthen its critical mass, and become a full-fledged research university. One of the current moves to achieve this is the evolution of the current EPFL campus to an extended multi-site campus with antennae throughout Western Switzerland. All within an hour of the main campus, these regional institutes will enable EPFL to achieve a critical mass and strengthen competitively at an international level; they will also offer dedicated scientific platforms for international cooperation.

EPFL research activities such as NCCR marvel (materials), NCCR robotics, EPFL [plasma physics](#) (and its relation to [ITER](#), “[digitalswitzerland](#)”, and [digital humanities](#)), contribute also by a local action to the international positioning of EPFL. This also includes strengthening EPFL’s participation in the European research area, with so far results in the following areas:

- EPFL Coordination of the EC [Human Brain Project](#) with laboratories located in Europe, the US, and Japan;
- 116 ERC grants;
- Space technologies (with the [Swiss Space Center](#)).

Online - MOOCs

With the aim of becoming a reference research university in the field of innovative teaching, EPFL was the first European university to embrace MOOCs (cf. A 2). EPFL has also launched a special initiative for the creation of MOOCs with Africa. EPFL participate to [OCEAN](#) - The [MOOCs](#) portal based on the Coursera Platform brings together the best French-speaking universities in the world offering MOOCs (EPFL, ENS Paris, ENS Lyon, Polytechnique Paris, UCLouvain la Neuve, Polytechnique Montréal); for further general information on Moocs, please see chapter A.

B.3.3.2. Offsite

the development of:

- [a continuous presence in the Middle East](#): EPFL Middle East with the launching of the first EPFL Master on sustainable energy in 2009, the first start-up created there in 2014 and [several collaborations](#) with KAUST;
- [of additional facilities abroad](#): currently the innovative [Venice for Digital Humanities](#) an [EU Teaming program](#) between EPFL and Croatia, a joint lab on [essential technologies](#) in Yaoundé and, in a near future, hopefully a Yersin Institute of Bioengineering in Ho-Chi-Minh City;
- [the participation to three international strategic networks](#):
 - [Eurotech](#): EPFL, DTU (Copenhagen), TUM (Munich) and TU/e (Eindhoven);
 - [RESCIF](#) - Réseau d’excellence des sciences de l’ingénieur de la Francophonie (EPFL, partner universities in Louvain, Paris, Lyon, Grenoble, Montréal, Rabat, Dakar, Ouagadougou, Yaoundé, Beyrouth, Ho-Chi-Minh-City);
 - [The global university leaders Forum \(GULF\)](#) within the World Economic Forum (WEF).

The international development is supported both by the Deputy to the President for International Affairs (on a strategic level) and his related [EPFL international Office](#), which also fosters European academic networks such as Eurotech (with an Eurotech Office in Brussels), [CESAER](#) and [CLUSTER](#). Furthermore, the EPFL International Office is connected with the net of [Swissnex](#), which provides international academic and technical intelligences (see fig. B 3.3-1 for an overview of EPFL international academic partners) and plays a key role in the settlement of agreements for student exchanges.

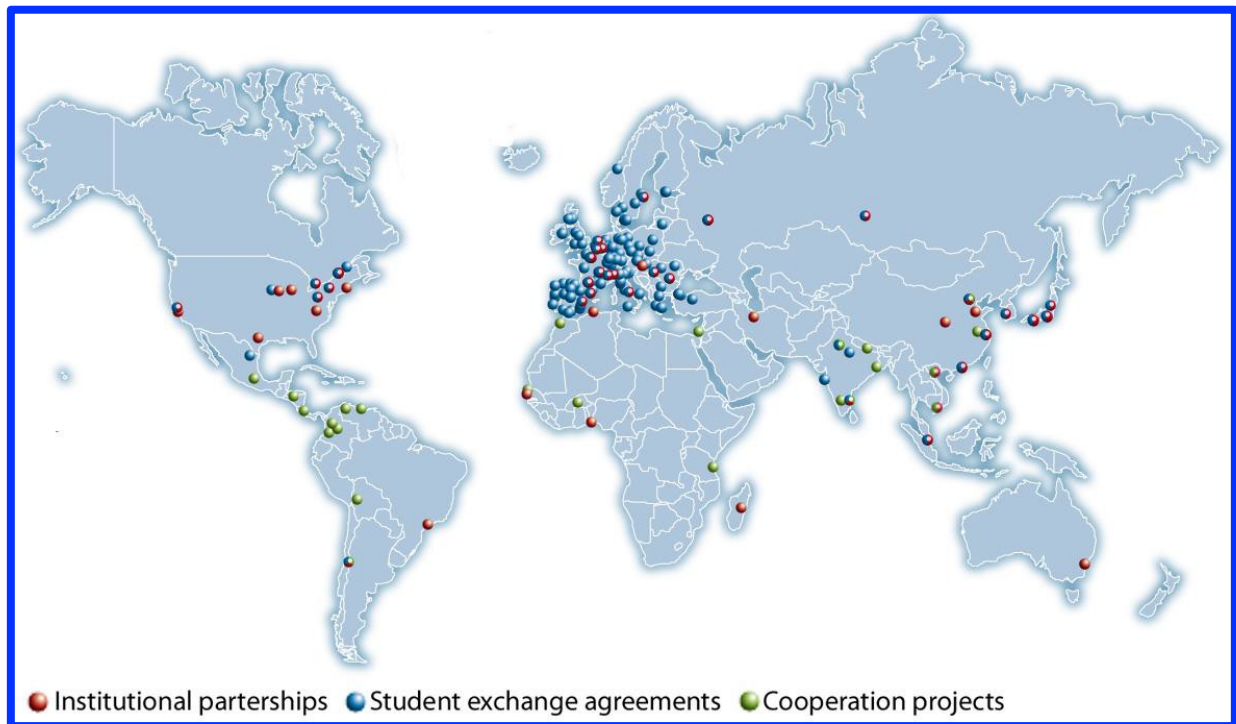


Fig. B 3.3-1 Map of EPFL academic partners

Selected individual [partnerships](#) either in central or done specifically by EPFL Schools have also developed on a global scale, with the with selected universities: in the US (Harvard Medical School, MIT, Stanford, Caltech, Carnegie Mellon), in the UK (Oxford, Cambridge, Imperial), in France (l'X, ENS ParisTech, INPG, ENS Lyon, ENS Cachan, ENS Mines Alès,..) Israel (Hebrew University of Jerusalem, Weizmann, Ben Gurion University, Technion), KAUST in Saudi Arabia, Russia (Bauman, Skoltech, MIPT), Asia (Keio and Osaka in Japan, KAIST in Korea, CAS and Beihang in China / HKUST in Hong Kong, VNU-HCM in Vietnam, NUS, NTU, A-Star, NRF in Singapore). They facilitate student mobility, and has allowed to extended student and faculty exchanges.

B.3.4. Student Mobility, Joint and Double Degrees

B.3.4.1.Students mobility

Switzerland has been suspended from full membership of the programme since 2014, after the country voted in favour of an anti-immigration initiative that contravened its free movement agreement with the EU. A few months later, the Swiss government approved an interim solution, financing 23 million francs in grants for Swiss students to allow them to continue with their exchange plans. As a 'partner country' of the EU, rather than a full member, Switzerland could arrange a series of bilateral agreements with individual European universities under the new name Swiss-European Mobility Programme (SEMP). This program is still financed directly by the Swiss Federal State. According to [recent news](#), Switzerland won't rejoin Erasmus before 2021.

Exchanges inside Europe have been ongoing with the best institutions such as TUM, KTH, DTU, etc., and are promoted by the [Registrar Office](#), and supported by a [Student Mobility Office](#). Currently we have:

Mobility out = 900 Bs or Ms Students in 2015-2016

Mobility in = 1122 Bs or Ms Students in 2015-2016.

B.3.4.2 Joint and double degree programs

EPFL proposes joint and double [degrees](#) but still conducts a restrictive and targeted policy. The university partners are presently:

- Technical University of Denmark (DTU) - Environmental Engineering
- Polytechnique Montréal (in French only)
- TUM München - Mechanical Engineering
- ISAE-SUPAERO (Toulouse, France) - Mechanical Engineering
- Politecnico di Milano - Computational Science and Engineering
- ENS de Lyon - Bioingénierie et Sciences du vivant (in French only)
- ENS de Lyon - Informatique et Systèmes de communication (in French only)
- ENS de Lyon - Biotechnologie et Ingénierie chimique (in French only)
- Polytechnique Paris (l'X) - (in French only)

B.3.5. EPFL Cooperation and Development

The scientific cooperation toward development is an integral part of the values close to the heart of EPFL, which also concern its internationalization strategy. The main arm of our institution to achieve this mission is the [Center "Cooperation & Development - CODEV"](#). Its actions are based on a number of projects implemented during the past decades by researchers from all disciplines and from all Schools. CODEV is part of the networks AUF¹, RESCIF² (implemented by EPFL), EADI³, KFPE⁴, quoting here the most important ones.

Based on partnerships, [CODEV](#) aims to promote scientific cooperation and the development of appropriate technologies for southern countries. CODEV strengthens research institutions in these areas by scientific exchanges within the framework of research projects and joint educational programs (list of CODEV's [post-training programs](#)). It seeks to orient technological innovation for its direct impact on sustainable development of companies in southern countries. In parallel, CODEV conducts awareness actions for researchers and students from EPFL regarding development issues and scientific cooperation and advice for setting up projects in the field. Research funding is an integral part of the activities of CODEV. CODEV has numerous partners (see the 2016 [annual report](#)), including academic institutions, town governments, foundations, international organizations, cantons, municipalities and cities.

CODEV wants to amplify and make the above area better known in and outside the school, and diversifying public and private funding sources for the benefit of the key actions of the center: EssentialTech; [UNESCO Chair "Technologies for Development"](#); within RESCIF, support two joint laboratories, [CURES](#)⁵ at ENSPY⁶ at Yaoundé, and [CARE](#)⁷, in Ho Chi Minh City. Through social networks, the biennial Tech4Dev Conference of the [UNESCO Chair](#) and through an active collaboration policy with EPFL units, CODEV reaffirms the relevance of the projects and increases their visibility.

For this purpose, the EPFL direction, the VPE, and CODEV have implemented a comprehensive fundraising strategy. CODEV coordinates with the student association [IdM \(Ingénieurs du Monde\)](#)⁸ to better integrate our students in the projects, and will tend to increase the number of research and educational projects in international partnerships. The dialogue with partner federal agencies will be emphasized, especially with [SEFRI](#) and [DDC](#).

¹ Agence Universitaire de la Francophonie

² Réseau d'Excellence des Sciences de l'Ingénieur de la Francophonie

³ European Association of Development Research and Training Institutes

⁴ Commission for Research Partnerships with Developing Countries

⁵ Center Universitaire de Recherche sur l'Energie pour la Santé

⁶ Ecole Nationale Supérieure Polytechnique de Yaoundé

⁷ Center Asiatique de Recherche sur l'Eau

⁸ Association Ingénieurs du Monde

B.4. LINKS AT NATIONAL LEVEL

EPFL has close [collaborations](#) with the institutions of the ETH domain, particularly through [competence centers](#) and [strategic focus areas](#) including *Personalized Health and Related Technologies, Data Science, Advanced Manufacturing, and Energy Research*. Endowed with specific federal budgets, those research and education activities are involving professors and PhD students of the two EPFs, or working in research institutes of the ETH domain. Other examples, such as the collaboration of EPFL, PSI and ETHZ, also exist, e.g. for the master in [nuclear engineering](#).

EPFL is involved in inter-university coordination led by the Rectors' Conference of [SWISSUNIVERSITIES](#), an entity that was recently created according to the new [Federal Act on the Funding and Coordination of the Higher Education Sector \(HEdA\)](#) in force since January 2015. This act serves as the legal basis for the new Swiss [“Conference of Schools for Higher Education \(CSHE\)”](#). Among its major mission, the CSHE works to strengthen and enhance collaboration among Swiss institutions of higher education, and promotes a common voice on educational issues in Switzerland. Furthermore, its subsidiary office, SWISSUNIVERSITIES, performs coordination tasks, and represents, at the international level, the national rectors' conference for all universities. It is responsible for the national coordination and monitoring of education in the Swiss Universities.

Within the continuous exchanges between EPFL and ETHZ, the Vice-presidents in charge of education and their Deputies have annual meetings to review and exchange on common topics.

In the framework of art. 15 of the [Law for the Encouragement of Research and Innovation](#), EPFL has formed alliances, giving it a certain academic responsibility, with:

- [CSEM](#), Swiss Center for Electronics and Microtechnology, which has two members of EPFL's management in its [board](#), and for which the ties with EPFL are also materialized through [joint projects](#).
- [IDIAP](#), the “Dalle Molle Institute of artificial and perceptive intelligence”, which has in its [foundation board](#) two members of EPFL's management including our VPE, and which has an EPFL lab located in this institute in Martigny.
- [IRO](#) (Research Institute in Ophtalmology).
- [Swiss TPH](#) (Swiss Tropical and Public Health Institute) with EPFL [CODEV](#).
- [Swiss Vaccine Research Institute](#).

B.4.1. LINKS AT REGIONAL LEVEL

Given the small size of the country, it is not always easy to distinguish the national from the regional level. In a realistic way, it must be said that regional delimitation in Switzerland very often coincides with linguistic and historical regionalism. Hence during the last decade, EPFL has extended its capacity to build bridges with other universities and universities of applied sciences throughout Western Switzerland.

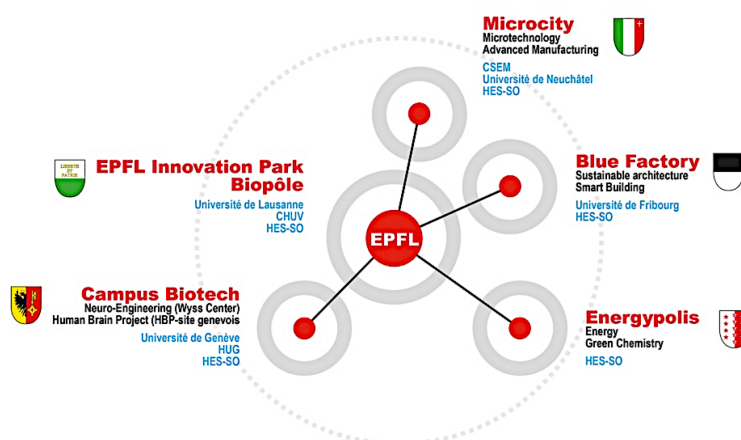


Figure B.4. - 1 EPFL antennas and points of collaborative links

The strong EPFL academic links at a local level materializes itself through close connections with our neighbor Universities in Lausanne (UNIL), Neuchâtel (UNINe), Geneva (UNIGe), and more recently Fribourg. EPFL Senior management has regular consultations and exchanges with the cantonal and local authorities of Geneva, Vaud, Valais and Fribourg.

A very close collaboration with UNIL is explained, not only by its proximity, but also by deep historical reasons. Indeed, before its federalization, EPFL was named École Polytechnique Universitaire de Lausanne, and was a full part of the University of Lausanne. Hence continuous exchanges were happening between EPFL and UNIL School of medicine and University Hospital of the canton of Vaud (CHUV) for research projects in biomedical engineering. Moreover, it is based on common interests in the field of microengineering and industry that have linked the University of Neuchâtel, the CSEM and the watch industry, including for the latter in Geneva.

The main strategy and mission of EPFL behind the strengthening of regional links, both for education and industry innovation and support, is to actively participate in the creation of the new ecosystem that Western Switzerland will need to face the challenges of the 21st century, and the fast evolution of its society and economy.

We mention here, as an illustration, some specific initiatives for both research and education:

- The already mentioned EPFL antennas in the cantons of Neuchâtel, Valais/Wallis, Geneva, and Fribourg (see also in previous chapters).
- Professors from the University of Lausanne give most of the teaching in social sciences and humanities delivered by the [EPFL College of Humanities](#).
- Accordingly, the teaching in "hard sciences" (Mathematics, Physics, Chemistry) to UNIL students, in particular to those enrolled in the [School of medicine and biology](#) is given by EPFL professors (particularly the qualifying course); the [EPFL-UNIL College of sciences](#).
- Participation in the "[Center Intégré de Génomique UNIL](#)", but also in the center of competence in bioinformatics [VITAL-IT](#) a strategic partnership with UNIL, UNIGE, UNIBE, as well as with the [Swiss Institute of bioinformatics](#).
- The collaboration between [ECAL](#) (University of Art and Design) and EPFL through the creation of [EPFL+ECAL lab](#), whose mission is to foster innovation at the crossroads between technology, design, and architecture.
- The future participation of EPFL at the new cancer research center [AGORA](#), which will be operational in 2019.
- The "Programme Passerelle" giving access to the master in medicine to talented life science and technology students from EPFL in collaboration with the medical schools of the Universities of Lausanne ([UNIL](#)) and now also of Geneva ([UNIGE](#)).
- The conference of coordination UNIL/EPFL (CHEL), with regular meetings (at least twice a year) of both EPFL/UNIL Senior Managements.
- The University Finance Center of Lausanne EPFL-UNIL ([CULF - Center Universitaire Lausannois en Finance](#)).
- A strong interface between EPFL and Departments of Public Education (DIP) and High Schools (Collèges et Gymnases) of western Switzerland is active to foster the best possible coordination and information between [the Swiss secondary educational system and our Institute of technology](#). Moreover, a specific representative of EPFL is assigned to cover the different Swiss cantons, and special days are devoted to the introduction of prospective students to the professional perspectives and curricula contents offered at EPFL.
- In the same line of local action for education, EPFL has recently created with the Higher Pedagogical School of the Canton of Vaud (HEP-Vaud) a new [joint Master in Mathematics for the training of high school teachers](#), education offering a new curriculum for teaching mathematics to students aged 15 to 19 years.

C. PROCESS GOVERNING EDUCATION AND PROGRAM MANAGEMENT AT EPFL

FOREWORDS

Developed countries around the world, including Switzerland, have identified a more highly educated population as an essential ingredient in their response to the current global issues. In addition to the present new economic and financial environments, shifts in the global economic center of gravity from west to east, the 4.0 revolution and digitalization of our society, demographic issues, climate change, health concerns, food and energy security, all increase the perception of an insecure future among our general population.

The higher education sector is therefore expected more than ever to play an essential role by providing the educated and skilled people that make up an increasing proportion of the private and public sector workforce responding to these challenges. There is no surprise about such expectations, since universities have traditionally performed much of the research and education that sought to understand and provide effective responses to global issues, to create the potential for generating new businesses and to provide opportunities for sustainable societies, economies and environments.

Since public funding is becoming ever more constrained, governments strive today to respond to the financial conditions they face. Moreover their members are also increasingly accountable to the taxpayers for the appropriate use of funds coming from the state. We may therefore all readily anticipate that university financial support may not escape to such trend. Hence reporting and evaluation processes (accreditation) required of universities by governments and funding institutions could well evolve in the near future accordingly. As a first answer observed across most advanced countries, public-private partnerships were developed to increase the interactions between business and higher education institutions. This was done not only to get new income sources for universities, but also to demonstrate a greater return on public expenditure in research.

While the higher education sector is becoming important as never before and governments recognize this, the sector will be therefore subject to considerable pressures, escalating demands and consequently need to change and adapt strategically. As a further reflection on the necessity to develop strong academic communities to face those educational challenges, we like at EPFL to refer to [the Millennium Declarations of the Colloquia held Glion](#) on the future of research universities, prepared by groups of scholars from Western Europe and America:

“In a society of shifting goals and uncertain values, the university must stand for something more than accurate data and reliable information; more, even than useful knowledge and dependable standards. The university is the custodian, not only of knowledge, but also of the values on which that knowledge depends, not only of professional skills, but of the ethical obligations that underlie those professional skills - not only of scholarly inquiry, disciplined learning and broad understanding, but also of the means that make inquiry, learning and understanding possible. In its institutional life and its professional activities, the university must reaffirm that integrity is the requirement, excellence the standard, rationality the means, community the context, civility the attitude, openness the relationship and responsibility the obligation upon which its own existence and knowledge itself depend”.

The case of EPFL

One way to measure public expectations about EPFL is indicated by the impressive increase in the number of students who apply. This is probably tied to the high visibility gained by EPFL for the quality of its research, and its impact in the media. Indeed, great research universities, like ours, give the perception to society that the education delivered is of the same quality as the research. Although this can still be realized in a “*near-vanishing Humboldtian world*”(corporatization of research-intensive universities), it may not necessarily be necessary the case, in few years from now, if EPFL will not actively bring continuous measures of adaptation and improvement to its teaching programs and infrastructure.

Hence, the tsunami of new students, observed on our campus during the last decade, has put all of us under an unprecedented pressure as far as infrastructure, teaching resources and pedagogical conditions are concerned. Such pressure is becoming even more acute in face of the heterogeneity of student populations, both in term of their level of preparation for exact sciences and in terms of cultural origin.

In that respect, EPFL had to face some inconsistency due to the Swiss system of education. Hence, the process used to hire high-quality research Professors cannot be equally applied to student recruitment, in particular in public universities such the two ETHs. The selection of students, already after the first semester of their propaedeutic year, with the obligation to follow upgrade courses to those who have not obtained sufficient scores (see A.2.4.), will hopefully help us to solve this issue. Similarly at the master level, incoming students are now highly selected according to specific prerequisites necessary to follow the offered discipline courses, in order to succeed well in their studies.

Coherent and smart answers to these challenges will be the cornerstone of EPFL educational strategy, providing the best possible education and training conditions for the future engineers, architects and scientists graduating in our institution.

GENERAL INTRODUCTION TO THE COMMON PROCESSES

(To avoid subsequent redundancies in the reporting documents written of each program)

C.I. GENERAL STRUCTURE OF THE CURRICULUM

ECTS credits for the Bachelor and Master's programs

Although the Bachelor's program has a constant number of ECTS credits for all sections (180 ECTS), EPFL's Master's program can be completed in 120 ECTS. Thus far, EPFL is promoting disciplinary Master's programs. This has helped maintaining a controlled number of different offers, and thereby ensuring a strong branding of our degrees.

However, the multidisciplinary required for the modern engineer necessitates some program flexibility. The latter is conferred at EPFL primarily by the introduction of minors or specializations. To this end, EPFL enables students in a program to take, if found appropriate under the guidance of tutors, 30 credits in a complementary field, in the form of minors or specializations. Thus, the number of students with a minor has increased significantly, those credits being integrated and part of the Master's programs still comprising 120 ECTS.

C2 DETAILED PRESENTATION OF THE EDUCATIONAL PROGRAMS

See specific documents presented by clusters essentially organized by schools and colleges according to the program of the OAQ/Cti visit

C 2.1- C.2.3. Communication with stakeholders

Existing Programs

Most of the *current programs* are the result of a long history and are periodically reviewed by various stakeholders:

- Internally by each section, the **teaching committee** convenes each semester to discuss the challenges and opportunities encountered in the curriculum. Professors, the intermediary staff as well as students are represented. It annually reviews the curriculum and proposes improvements and adaptations to the school's management.
- Since the accreditation in 2006, **advisory committees** have been created by the curriculum to reflect the needs of employers in industry. They regularly give their views (annual review) the education offer of the Bachelor's-Master's programs (for specifics, see the report on the sections).
- Since 2015 an **academic committee** responsible at the level of program direction to verify the accurate coordination of courses, the quality of examinations, and other procedures to ensure that the learning objectives are assessed properly and achieved (see the report on the sections).

Design and approval of New Programs

For the establishment of *new Bachelor or Master's programs*, the project is first presented and discussed by the EPFL Senior Management with the School Deans. The VPE is thus directly involved and is responsible to promote guidelines to this intention. The guidelines state, firstly, that any new education should be complementary and not compete with existing programs and, secondly, that it should appropriately cover a given scientific field. They also stress the need to be "*in tune with the requirements of both the public and private labor markets, and open in principle the door to a doctoral program with a view to a subsequent academic career*", and "*to be an additional and non-competitive option to an existing offer (minors and specializations included)*".

Implementation of curricula and regulations (for existing and new programs)

The process of *implementing the curricula and regulations* involves the following steps:

- *Proposals for changing or proposing new courses from a responsible section and School are subject to the [Registrar's Office](#)ⁱ (SAC) for verification of the compliance of the proposed changes with the ordinances.*
- *The curricula and rules are then presented and discussed at the Conference of the Directors of programs (CDS) for harmonization and consultative approbation.*
- *The curricula and regulations are finally submitted for approval by the EPFL Senior management.*

C.3. PROGRAMME CONTENT AND OUTCOMES (AT SCHOOL LEVEL)

Following the first accreditation in 2006, a pilot project was launched in the mechanical engineering section for the definition and implementation of learning outcomes (LO) and business skills to describe their curriculum. This work was presented at the intermediary audit of 2010. Taking their experience into account, for September 2013, all sections were required to define their courses based on LOs. Since spring 2014, the sections summarized the competencies to be obtained in each course in generic tables. The details can be found in the description of each course.

The Teaching support center ([CAPE](#)) and quality unit provide valuable assistance to the sections to better specify the LOs of each course and to establish education objectives of the programs according to a frame of reference for each profession. Management applications of the studies on IS-Academia enable each professor to set LOs for their courses and the sections to validate and coordinate this information in the management of their program. The LOs contain both scientific and technical competencies, such as know-how and cross-disciplinary skills. Three different competence levels have been defined for the scientific and technical expertise. They correspond to a simplified Bloom's taxonomy (see also Chapter F).

C.3.1 PROGRAMME CONTENT AND OUTCOMES (AT PROGRAM LEVEL)

The content of each program is detailed in the course booklet, published on the web by each section. It contains the course details for each program already available on the web (see Annex C III-I). The course details contain the following information:

- *A summary.*
- *The content and keywords.*
- *Training program breakdown*
- *The learning outcomes (LOs) and cross-disciplinary skills.*
- *The prerequisites for the course and important concepts.*
- *The expected teaching and work methods.*
- *Evaluation methods and weighting.*
- *Supervision, resources.*
- *Credits and workload, and the teaching language.*
- *Compliance of the curriculum with EHEA standards*

The consistency and respect of those principles is the responsibility of the section in question. The analysis of the curriculum presented during this self-assessment by the sections contains summary tables of the LOs of each course.

C.4. PROGRAMME IMPLEMENTATION (GENERAL EPFL RULES)

The school has defined and validated its studies regulations, which are made public on the Program Direction (Section) Website and thereby communicated both to prospective and, by definition, to those students arriving in the school. Studies and evaluations are adapted on a case-by-case basis and take account of individual situations related to [disability or specific pathways](#).

Each course contains a variety of teaching forms and examinations. The first qualifying year is devoted to learning engineering bases. The amount of practical work increases as the studies progress. Students quickly come into contact with the research performed in the laboratories of EPFL. The details of the activities are summarized in the curriculum which indicates course lectures (c), exercises (e) or practical work (p).

The total workload seems to correspond to expectations. During the [Campus II survey](#) the students presented an average load of 52h/week. Spread over the 14 weeks of the semester, and adding the preparation for and passing of exams, this correlates well with the expected 900 hours for 30 credits per semester.

The engineering programs all include an industrial internship of at least 8 weeks, either credited separately to the Master's cycle, or together with the Master's Thesis. Optional courses allow flexibility with regard to orientation at the end of the Bachelor's program and especially to the Master's cycle.

The tests and exams can take many forms. We distinguish in particular between the continuous verification throughout the semester and an exam after two weeks of preparation after the course ends. A Master's thesis, lasting 17 to 25 weeks (one semester), is required at the end of the curriculum.

To guide students in their choice of options, orientation, specializations or minors, study advisors are appointed. They help the section with its management and advise students who need it. The career center also gives them valuable advice. During the 1st year of the Bachelor's program, a critical year for the selection, a system of mentorship was put in place for courses in general physics and analysis. 3rd - and 4th - year students supervise groups of 8 to 10 students as they perform exercises. The tutors are themselves taught by the professors and their PhD student assistants. The goals are to improve the working methods of the young newcomers to EPFL and facilitate their integration into the university mode of working.

At Bachelor level, the new selection of students after their first semester of the propaedeutic year has been implemented since September 2017 with the upgrade MAN courses. Moreover, since September 2013, the propaedeutic courses have 2/3 of their contents as polytechnic courses of a common level. Thus, for the engineering sections, there is already an identical exam for chemistry and linear algebra. This common polytechnic basis includes:

- *Analysis I and II.*
- *Linear Algebra.*
- *Physics I and II.*
- *Information, Computation and Communication.*
- *Introduction to Life Sciences*
- *Global Issues.*

The curricula in basic science all have more advanced courses in their respective fields (physics, math and chemistry). The curricula in computer science, communication systems and architecture have a suitable program. The course ["Global Issues"](#) has been introduced for all students in the second semester of the qualifying year. The purpose of this course is to increase the cross-disciplinary skills of our students by raising awareness of the central problems of our society and the opportunities for an engineer to help solve them.

C.4.1. Work-based training

Introduction of the mandatory internship program

An industrial [internship](#) is mandatory for all EPFL Master's programs awarding the title of engineer or architect. In the IC and ENAC Schools, internships were in place for many years, but were optional, with the exception of the architecture section, where a one-year internship was mandatory.

Internship models

The internship models chosen by the Master's programs for the curricula include three variants:

- *Short internships* (min. 8 weeks) usually during the summer. The short internship may be extended to the following semester.
- *Long internships* of 4 to 6 months.

- *Master's thesis in a company.*

Depending on the Master's programs, the internships give from 8 ECTS (for 8 weeks) to 30 ECTS (for 1 semester), or are simply validated as completed for a Master's thesis performed in a company, worth 30 ECTS as a Master Thesis does, but without gaining further credits for being done in industry. Sections have considerable autonomy in the matter, and this is indicated in the regulations of each program.

Internship advertisement [portal](#)

Companies are invited to post ads using the EPFL's internship portal. Students also apply through this portal by uploading their application to the internship accounts of the companies in question. There are generally enough offers accepted for publication by those in charge of the Master's programs. Only internships capable to give students the possibility to acquire the desired learning outcomes are retained and validated by the program's responsible person.

Evaluation of the internships

The internships are evaluated, on the one hand in the company, by the direct supervisor of the student. A form is filled out regarding aptitudes and professional skills with a comprehensive final assessment expressed with 4 levels of appreciation (Excellent, Good, Adequate, Poor). This report is sent to the person in charge at EPFL, who performs a final validation, make an interview of the student, and then transmits the grade "passed" or "failed" to the academic service. Master's theses are not evaluated in this way, but personally by the in charge teacher as for a regular defense exam. The global assessment of the interns is computerized today in many programs. The data are very useful to assess both the overall quality of the internship, and the performance of our students. Hence, as evaluated from those data, two thirds of the students receive the maximum rating (Excellent). The table below summarizes the results that were obtained for the year 2013.

Overall assessment of interns by their supervisor (2013)		
Excellent 61 %	Good 34 %	Adequate 5%

Impact of internship on employability

In addition to enabling students to acquire practical skills through immersion in a company, internships play a positive role in the employability of our graduates. They appear in the eyes of employers to be more aware of the realities of the working world and to be operational faster. **Our employability surveys show a correlation between having done an internship and a greater ability to find work.**

Introduction to research, possible internships

Research training is provided by many semester projects and practical lab work is performed directly in the institutes, and research centers of our school. Details can be found in the part about the sections.

Conclusions on internships

- EPFL internship program is currently a success in the sense that, according to their currently satisfactory and smooth organization, today students have no major difficulties in finding an internship, and that the satisfaction of the companies regarding the quality of their work is high.
- The EPFL portal for internships has demonstrated as a valuable tool to allow companies to distribute their offers. Ongoing success in extending such tool nearly to all programs has been accomplished. This was performed not only to improve its usability to record and extract data on internships, to quote it in the degree, but also to establish an automatic and reliable extraction of performance indicators.

C.4.2. Research activities for students

EPFL being a research-intensive university, most of the theoretical courses are strongly based on and illustrated by the latest progress in research. Hence, semester projects are offered by most of the section already at the bachelor level, which can be done in the institute's research labs. Moreover, with the new venue of the Discovery learning lab new opportunities exist for all programs on the EPFL Campus.

C.4.3. Innovation and entrepreneurship

With the new venue of the Discovery Learning Lab initiative (see above under A. and 1 and A.2.6.1, A.2.6.2, and B2.2), EPFL is now capable to promote a strong spirit of innovation and entrepreneurship in its students.

C.4.4. Awareness of International Context

C.4.4.1. International Culture

The student experience at EPFL is in itself an exposure to the international dimension of the engineering professor. Around one half of our Master's students are of non-Swiss origin, which means that any of our students will be exposed to a rich cultural mix without ever leaving the campus. Add to this the fact that more than half of the teachers, teaching assistants and lab work supervisors are also non-Swiss and that English is the language of communication in most of our labs.

Most EPFL professors and Senior Scientists have spent part of their academic youth in well-known institutions abroad. This is a result of the smallness of Switzerland and the fact that moving abroad for a doctorate or postgraduate employment is quite mandatory. Our students benefit from the academic networks of our professors, but also from the general international outlook that permeates the teaching at EPFL.

C.4.4.2. Language Proficiency

Both French and English are central languages from both an academic and social perspective at EPFL since they are the two teaching languages.

When it comes to the teaching languages, a C1 language level is recommended to our students (French for the Bachelor's program and English for the Master's cycle). This is a prerequisite in order to take the courses under the best possible conditions. For all new Bachelor's students, EPFL has introduced a nonselective English test. This test focuses on oral comprehension, as well as understanding and expression of the written language. Students are then informed of their results and encouraged to take free courses at EPFL's [Language Center](#) to reach the C1 level prior to enrolling in the Master's program. The results of this test shows that EPFL students will reach at least a B2 level of competences in English thanks to the English exposure during bachelor and master studies.

In contrast to Master's courses, which are only given in English, for all bachelor programs, the number of courses in English increases progressively throughout the studies, allowing students to get used to it and address any shortcomings. The Education Affairs and the sections encourage students to take English courses (emails are sent to them in the beginning of each semester, and more information is regularly presented on the school's Polynex screens). Some sections, such as that of Computer Science, for example, mandate our Language center to develop courses specifically for their students. EPFL's Language center also offers courses for teachers who want to improve their language skills in order to teach the academic content in English or French. EPFL's [Language center](#) offers students and EPFL's employees courses for learning English, German, Italian and French. Students have priority for course registration. Teaching methods include: group learning, individual learning with tutoring or independently in the media zone, work in pairs, intensive courses, etc. To meet the requirements for academic language proficiency, the Language center is managed since the fall 2006-2007 by the University of Lausanne (UNIL).

C.4.4.3. Cultural Background

EPFL has more than 120 nationalities, and 64% of its Faculties are from international origin. Therefore, the experience gathered during the courses, practice lab, semester projects in research labs provide students with a unique international and multicultural opportunity. This is even truer, at the master level during their master thesis, to open their mind on campus to the diverse range of technological, socio-economic and cultural factors.

In addition, to enable students to broaden their knowledge and promote "*interculturalism*" at

the bachelor level, EPFL also supports and promotes mobility during the last year of the Bachelor's program. In this case, students are selected based on their academic results to ensure the success of their exchange period, so as not to prolong the duration of their studies if they don't find all the equivalent credits in their visiting university when abroad. To limit this risk, EPFL proposes a network of [partner institutions](#) offering equivalent education, specific grants, and a mobility support service.

C.4.4.4. Outbound and Inbound Mobility

EPFL has an extended and active network of international partner universities. Engineering students have the opportunity to do an **outbound mobility** and spend up to one full year abroad during the last part of the Bachelor's. About 1/3 of our Bachelor's students take advantage of this offer, which is under the supervision of a coordinator for exchanges, who will interview the student and determine whether spending time at a partner university is adequate for their training goals.

The [mobility](#) offer has been harmonized between all sections of the school. In the Bachelor's program, students must have achieved an average mark of 75% in the first year in order to go abroad and even higher (85%) in order to qualify for a spot in a North-American or Asian institution at the bachelor level.

Each section has a mobility advisor who helps candidates prepare their academic career on the outside, who validates the choice of courses before their departure and who validates credits earned upon their return. The monitoring of results shows that a vast majority of students manage to earn more than 50 credits during such a year abroad. The countries where we have partner schools can be found [here](#). During the Master's program, mobility is generally performed by carrying out a semester-long Master's thesis at another university abroad.

During the Master's program, the core program has to be done at EPFL. The Master's Thesis is, however, another opportunity for spending time in a partner university or an industrial lab. Last year, about 14% of the students took advantage of this possibility and an additional 8% went to another university in Switzerland, which often also implies a change of language and culture. These exchanges are typically arranged between professors, with relatively little administrative burden.

Concerning **inbound mobility**, EPFL distinguishes two types of student mobility: those which remain enrolled in their home university, and do not receive an EPFL degree (e.g., those participating in the Erasmus program: horizontal mobility), and those who join EPFL to complete a Master's program and receive our degree (vertical mobility).

Horizontal mobility is described on the [webpage](#). A range of services is offered to these students. They receive follow-up by the persons in charge of mobility in each section, are included in the courses according to their needs but follow and take the same exams as the EPFL students.

In terms of vertical mobility, the institute of technology receives more than 2000 applications per year to start our Master's cycles with a Bachelor's degree from outside EPFL. Our admission committee selects approx. 25 %. In the end, 250 to 300 students choose to join EPFL each year to do their Master's program. They come from all over the globe. The department of Student Affairs ([SAE](#)) offers a range of services to accommodate students, especially those who join us for the Master's program. Certain [activities](#) are specifically organized for them to facilitate their integration.

C.4.5. SUSTAINABLE DEVELOPMENT, ETHICS, AND PROFESSIONAL ETHICS.

Students receive during their first year at EPFL courses on [Global Issues](#), which open them to society challenges such as sustainable development, ethical issues and technology. The Social Sciences and Humanities Program offered [ethics courses to all engineering programs](#), giving students the possibility to take specific courses on ethics, although the latter are mainly optional. In other programs, ethics courses dedicated to their specialty, such as [in Life Sciences and Technology](#), are taken by the majority of students.

Each program is expected to introduce, at least in some of their advanced courses, discussions aiming to deliver such learning outcomes and transversal skills to their students. There is, however, a clear room for improvement in those domains, although some sections, such as those delivering programs in environmental sciences and engineering, or management of energy and sustainability address directly or indirectly those questions in many of their master courses.

From C.5.1. to C.5.3 see program break down and description by sections.

C.5.4. STUDENT LIFE

Organization and Tasks of DAF

The office of educational affairs (DAF) provides benefits and academic activities related to academic management, student life and education support. It offers services in the field of educational affairs, for students and teachers alike at EPFL. Maintaining a close partnership with the students, it ensures their active participation in the running of the school and campus. Moreover, the director of Educational Affairs, responsible for the units of DAF, advises the Vice President for Academic Affairs in all projects related to "studentlife".

Campus Activities

The Office of Educational Affairs (DAF) provides institutional support (logistical and financial) to student associations, contributing to a vibrant and lively campus. EPFL also has a sports center (in collaboration with the [University of Lausanne](#)). Moreover, the students are encouraged to organize various events and activities. In 2013, [67 student associations and commissions](#) recognized by the EPFL proposed numerous activities, (*Vocational, entertainment, development, EPFL students, students by country, official representations of EPFL students, Science & culture, sport*) i.e. organizing activities that promote the integration of new Bachelor's and Master's students ([coaching](#), Xchange, etc.) participation in sporting events (Challenge, EUGA, etc.),etc.. Recognized associations benefit from personalized follow-up, financial support (of around 200,000 CHF / year), have access to premises temporarily or permanently, and other logistics services. The complete list of associations can be found [here](#). In addition, each program has very often its own student associations, which are not in the indicated list. It is noteworthy that EPFL mentions activities such as class delegates, or participations in the committees of the recognized associations, in the Diploma Supplement by indicating the fulfilled duties and responsibilities.

Attesting to the dynamism of cultural and leisure activities on the UNIL-EPFL campus, the pamphlet "*Côté culture*" is published in conjunction with the [Cultural Affairs](#) of the EPFL and the University of Lausanne (see Annex C VII-I). Distributed at the start of the academic year, it is available in all public places.

DAF has also established close contact with the General Association of EPFL students ([AGEPoly](#)). In addition to the monthly contacts with DAF, elected members (the steering committee of AGEPoly) meet at least twice a year with the EPFL management; all projects involving education and student life on campus are subject to a consultation via AGEPoly's "representation" team to achieve a representative number of students from all sections.

Supervision of and Support to Students

The steering committee of AGEPoly organizes a *welcoming week for new students* the week before classes start. Experienced students welcome the new "freshmen" and help them to discover the premises and student culture. Each year, hundreds of [students](#) participate. During the same week, courses on work methods (time management, note taking) called "the job of being a student" are offered by the department of Student Affairs (SAE). More than a quarter of the [new students](#) participate.

During the semester, the office of student affairs [SAE](#) advises new Bachelor's students and offers, with the support of specialists, [support courses](#) that are complementary to the education, as well as a [coaching](#) program, provided by students in collaboration with AGEPoly. SAE also organizes the reception of international students joining our programs at the Master's level, i.e., exchange students, or state scholars, as well as those who have applied for vertical mobility in our school. The purpose of this welcome is to offer them the best possible integration and ensure EPFL's quality approach. Particular focus is put on the effects of a "culture shock" that affects all international students. The **Career Center**, established since 2006, offers a wide range of services to students to prepare them for [employment and career](#) entry (cf. D II).

Social, Financial, and Healthcare Support

New students who need advice, information or just want to talk with a student of a higher year can go see a [coach](#) in their section. They are there to facilitate the entry into university life. For international students, [other coaches](#) are available to answer their questions, and to give them support. In addition, each student can turn to the class delegate who is a spokesperson communicating with the various responsible persons of EPFL programs.

The [EPFL Social Committee for students](#) can assign a number of [grants](#) to students whose financial resources are particularly limited. It analyzes the applications by taking into account its attribution rules under the Grant Ordinance ([Ordinance 414.154 on grants and loans from the Federal Institutes of Technology](#)), in response to economic or personal hardship. Social grants or study grants are generally issued by the recipients' home cantons.

Furthermore, students in search of an adequate help can on get a free initial [psychotherapy consultation](#) on the campus. EPFL also provides students and employees with a confidential [support network](#) to solve problems of a relational hierarchical order within the institution.

Students Dormitories and Housing Office

EPFL does not have any rooms managed directly on the campus and it is the responsibility of each student to find a home for him/herself. However, there are many [student halls](#) managed by external organizations (foundations, estate agents, etc). These student halls are all very close to EPFL or easily accessible by public transport. Currently, there are about 3'000 rooms that are offered in these halls for both EPFL and UNIL students.

Parallel to the student halls, possibilities exist of renting rooms with private landlords or in flat-shares with other students. We encourage all our prospective students to pursue these options. The universities were forced to develop such solution through the years to compensate the lack of student housing. A housing database reserved for EPFL and UNIL students gathers thousands of [ads](#) each year. Looking for flats or studios through real estate agencies remains complicated for students because of the very tight housing market in the area, and many guarantees are required such as a Swiss [guarantor](#).

The mission of the [Housing Office](#) is to inform and advise students and PhD students of EPFL in their search for housing; expand the supply of housing in Lausanne and its surroundings; ensure the sustainability of housing from private and institutional landlords; retain private and institutional landlords and adapt the conditions of the renting to the needs of the students. The housing office gives advice, answers to various questions about housing in general and ensures a connection of information between students. It manages the database of ads from private landlords together with the housing office of UNIL.

Language Center

The [Language Center-at EPFL](#) offers all students and members of the EPFL community a high quality level of teaching that meets the requirements of their studies, exchanges and/or their current or future work:

- *a general development of language and communication skills;*
- *modular courses focused on specific needs;*
- *the preparation for various examinations and certificates;*
- *individual learning by oneself;*
- *teaching of specialized languages for different disciplines.*

The languages taught are French, English, German and Italian (see also above).

The Student Service Desk

The [student service desk](#) established since 2007, is the main point of contact for all prospective and enrolled students of EPFL. Its mission is to welcome and inform people interested in the education provided at EPFL. In particular, it answers questions related to benefits and academic services from students throughout their studies. Complex queries are redirected to specialist services. The objective is to provide 80% of the answers directly at the student service desk. This objective is achieved every year to students' satisfaction.

From C.6. to C.6.2 see program break down and description by sections.

C.6.3. ENGINEERING QUALIFICATION CERTIFICATION

Legal framework for obtaining the degree

The right to issue Bachelor's and Master's degrees has been conferred on EPFL by the Federal Act of 4 October 1991 for institutes of technology (ETH Law, art. 19). The holder of a Master's degree in engineering or architecture is allowed to use the title of **EPF/ETH-certified engineer or EPF/ETH-certified architect** under Annex I of the Ordinance on the Bachelor's and Master's education at EPFL.

The degrees, bearing the seal of EPFL, mention the name of the graduate. The President of EPFL, the Vice-President for Education, and the Program Director sign them. They are accompanied by a "**Diploma supplement**", established bilingually in French-English, and describe the level, context, content and status of the studies that have been successfully completed. The degrees mention the field of study and for the Master's degree, the professional designation of the holder, as well as a particular orientation where applicable.

Academic and professional recognition

The professional recognition of an EPFL engineering degree differs from the academic recognition of a corresponding Bachelor's and Master's degree.

Academic recognition

This recognition is cardinal for an international business or for academic mobility; Switzerland has signed the Lisbon Convention and numerous bilateral agreements with its first neighbors. The recognition of our institute of technology by the AAQ (Swiss Accreditation Agency) affiliated with the [ENQA](#) also validates its programs within the framework of the Bologna process (excluding that of the Cti which reinforces this recognition by its capacity to deliver the EUR-ACE quality label).

Professional recognition of EPFL engineer degrees

On the national employment market, Switzerland regulates very moderately, as compared to many EU countries, how to exercise the profession of engineer. It relies on the requirements of the employers, the value of the recognition of ETH or HES and the professional associations to exert control. Accordingly, the holder of an ETH degree with the professional designation of engineer can directly access the job market without first having to integrate an engineering council to fully exercise his profession, as is the case for example in USA and Canada¹.

The international professional recognition of the engineering, scientific and architectural degrees from ETH with regard to the qualified practice of the profession varies from one country to another; not only within the EU but also around the world. For engineers, its importance also varies depending on the engineering education in question: while it is important for civil engineering professionals, for instance, it has less weight for a computer engineer (for example¹). It is however facilitated:

- a) by the international excellence of EPFL and the reputation of its education;
- b) by the EUR-ACE label whose Master's degrees are Cti-certified;
- c) by a commitment within the [Alumni Association](#) of EPFL (<https://www.epflalumni.ch>) and scientific associations (Association of Engineers and Architects) that can be grouped in an academy ([Swiss academy of technical sciences](#) or [natural sciences](#)).

¹ However, some states are very restrictive in the use of the engineering title; in Quebec, for example, it is forbidden for certified ETH engineer to put the title engineer on their business card and this regardless of their specialty; for those breaking this rule, the company that employs them must pay heavy fines to the Council of Engineers of Quebec (OIQ; <http://www.oiq.qc.ca/Pages/accueil.aspx>).

Role of the REG foundation in Switzerland

Note in this context the particular role of the REG foundation, a semi-state body, which assigns a quality standard to members of its category. In priority, [REG](#) concerns professions taught by ENAC: architects, civil and environmental engineers, but also to a lesser extent machine construction, electrical engineering and computer science. Obtaining the designation REG A is facilitated for the holders of ETH Master's degrees, and enables the inclusion in the European [Federation Eur Ing of FEANI](#). However, this federation is still little used and the project of a European "passport" for the engineer (of the same type as that for health professions) has yet to be completed.

In addition, the REG foundation conducts since long ago in Switzerland a form of recognition of prior learning (or experience) for the engineering education, allowing experienced HES engineers to obtain a level equivalent to that of an ETH engineer (REG A) or an experienced technician to obtain a level equivalent to that of an HES engineer (REG B). This recognition, which increases the professional recognition of its recipient, can also play a role when determining a salary.

D STUDENT ADMISSION AND SELECTION (AT SCHOOL LEVEL)

D.1. ADMISSION AND SELECTION STRATEGY

There are several possibilities to enroll in EPFL's bachelor's and master's programs. Our selection criteria are published on our website under ["Prospective students"](#). In general, the bachelor's degree has French as the teaching language and students are recruited from French-speaking regions. They are particularly Swiss high school students (also from German-speaking Switzerland) that have a Swiss Matura (cantonal certificate recognized by the Swiss government or federal certificate). When it comes to the holders of the *French baccalauréat* and applicants from French-speaking Africa, EPFL only admit candidates from these countries with a BAC S, and with average scores in math and physics equal or above 16/20. This was shown to be the level required to match with a Swiss Matura. The results of selected candidates are monitored year after year by the ["Organisation et gestion informatique de la formation"](#) (OGIF). (General tables and indicators will be available during the visit)

D.2. - 2.D.3. ORGANISATION OF STUDENT ADMISSION AND SELECTION

EPFL revisits on a regular basis the equivalence criteria to be accepted when a student applying is coming from a foreign country. All criteria are published on our [website](#) and on the website of [SWISSUNIVERSITIES](#). In rare cases, particularly for students from French preparatory programs, and for those passing with success the competitive entrance examinations at EPFL, admission to upper years in the bachelor's program is possible upon [application](#) file.

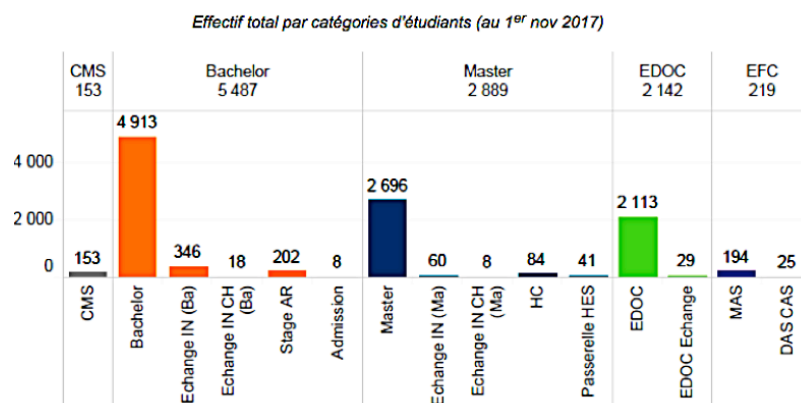
The master's classes are mostly in English and recruitment for the master's cycle is open to the whole world. We receive about 2000 applications each year, preselected upon application file by the corresponding section, and the retained candidates must see their acceptance confirmed by a central admissions committee. The strategy here is to find candidates with a level at least equivalent to, but preferentially higher than that of internal candidates. Twenty or so ["excellence fellowships"](#) are offered each year to attract top candidates. Good corresponding levels during the Master's studies were observed between internal students and those with an external bachelor's degree, thereby validating the selection process.

D.4. ADMISSION CRITERIA

The Bachelor's Program

Recruitment for the Bachelor's program

The applicants for the Bachelor's program are mostly French speaking. Our future students come from all regions of Switzerland, France, and Luxembourg. Exchanges with other regions of Switzerland are strongly encouraged. Although those students have graduated in high school graduates from non-French speaking parts of Switzerland, they have also studied French as a national language, and can choose to go to EPFL. To facilitate their insertion, and also that of English speaking students, math and physics courses are given during the propaedeutic year in French, German, and even in English.



Evolution des effectifs CMS, Bachelor, Master (sans les hors cadres), Doctorat et Formation continue

The conditions for the admission to EPFL are defined in this [federal legal ordinance](#). Concerning the commission responsible for admission to the courses leading to the Bachelor's and Master's degrees at EPFL, the Vice-President for education determines its composition and tasks. He may delegate to it the power to make decisions under the rules fixed in the ordinance. The Matura gives direct access to the first year of the Bachelor's program without prerequisites. Scientific school-leaving certificates issued by a member of the countries of the European Union are admitted to the first year of the Bachelor's program only if they satisfy the condition of a weighted grade point average equal to or exceeding 80% of their maximum score.

Admission to the propaedeutic year

Swiss certificates

Regarding the Swiss certificates, holders of a cantonal Matura certificate recognized by the federal government, a federal Matura certificate or a diploma from a University of Applied Sciences (HES) are without examination admitted to the first-year program in all sections of EPFL

Upper secondary school certificates from a country that is a member of EU or EFTA

Applicants holding an upper secondary school certificate from a country that is a member of EU or EFTA (other than Switzerland) are accepted in the first year of the Bachelor's programs provided that their title fulfills all of the following conditions:

- *the final grade average is 80% or more of the maximum grade*
- *the completed certificate is a pre-University title granted on the basis of a general education*
- *the completed certificate is in a scientific stream (should streams be offered by the country granting the certificate); - the following subjects are part of the certificate: 1) mathematics, 2) physics and/or chemistry, 3) national language of the country granting the certificate, and 4) second modern language*
- *at least three of the following subjects are part of the certificate and/or the transcripts of the upper secondary studies: 1) applied mathematics or computer science, 2) physics or chemistry or biology, 3) general geography, 4) general history, and 5) third modern language.*

Should admission not be automatic in the universities of the country granting the certificate, a document attesting admission to a University stream of study close to the fields taught at EPFL in a University in the country granting the certificate, valid for the coming academic year, is required as a supplement.

Upper secondary school certificates from a country that is not a member of EU nor EFTA

Applicants holding an upper secondary school certificate from a country that is not a member of EU nor EFTA can be accepted, following the evaluation of their application and within the places available, in the "Cours de mathématiques spéciales" (CMS), provided that their title fulfills all of the following conditions:

- *the final grade average is 80% or more of the maximum grade*
- *the completed certificate is a pre-University title granted on the basis of a general education*
- *the completed certificate is in a scientific stream (should streams be offered by the country granting the certificate); - the following subjects are part of the certificate: 1) mathematics, 2) physics and/or chemistry, 3) national language of the country granting the certificate, and 4) second modern language*
- *at least three of the following subjects are part of the certificate and/or the transcripts of the upper secondary studies: 1) applied mathematics or computer science, 2) physics or chemistry or biology, 3) general geography, 4) general history, and 5) third modern language.*

Summary of the Admission criteria to EPFL Bachelor's programs

There are thus three main scenarios for admission to the Bachelor's level at EPFL:

- *admission to the first year (especially for Matura holders),*
- *admission to upper years (especially for students of French from preparatory schools), or*
- *admission to the preparatory math course CMS (especially for holders of a professional maturity certificate, an foreigners from emerging countries that we want to help).*

For full information, see [here](#).

Admission to the Special Mathematics Course (CMS)

CMS - the Special Mathematics Course is a preparatory year and if completed successfully it gives admission to the first-year program at EPFL (see [rules](#)). The number of places available conditions admission to CMS. This gateway course is designed for specific audiences:

- For Swiss diplomas, holders of a professional maturity certificate are likely to be admitted to the CMS as long as there are enough available places and the candidates are younger than 25. They must pass this preparatory year to be admitted to EPFL's first-year program. Applicants that are not admitted can always take the admission exam (see below).
- Holders of a Matura cannot be admitted to the CMS, as they are eligible for the first year of the Bachelor's program.
- Holders of a foreign baccalaureate who do not meet the admission requirements in the 1st year of EPFL. The success of the CMS allows these students to access the training of their choice at EPFL. The great diversity of their origins gives the CMS its international character and the possibility to EPFL to support students from emerging countries.

Admission exam

Any candidate who does not fulfill the conditions for admission to the first-year program can also take the full or reduced admission exam. Candidates must pass this exam to be admitted to the first-year program according to EPFL's [ordinance on admission](#).

Links with high schools (schools for upper secondary education)

EPFL is very involved in issues of the high school-EPFL transition. Matura certificates and their level in terms of required basic skills are a crucial part of admission to EPFL. The Federal Council and the Swiss Conference of Cantonal Ministers of Education ([EDK](#)) coordinate the recognition of certificates of maturity with a joint body: the Swiss Maturity Committee: EPFL is present in this committee, as well as in working groups proposing the reform of the Matura. To participate in the development of training for high school science teachers, EPFL, which is again a stakeholder, collaborates with the University of Teacher Education in Vaud (HEP - Haute Ecole Pédagogique du canton de Vaud). In this context, a new joint EPFL-HEP [Master's program in Mathematics dedicated to education](#) has just been created, with the aim of ensuring a high level of education in mathematics as well as pedagogy and didactics. In addition, a new high school portal with a quarterly newsletter has been created, which promotes exchanges with high schools, informs about seminars and scientific events of interest to high school teachers and offers educational material developed at EPFL that can be used at the high school level. For more information, see [here](#).

Admission to upper years

These conditions apply mainly for students from French preparatory schools (e.g., CPGE) and candidates for entrance examinations of ENS Lyon. An admissions committee that communicates its decision in late July processes the applications. The candidates are personally informed in the beginning of August. All other candidates who can prove an equivalent academic education in Switzerland or abroad, have the possibility to submit their applications even if admissions during the Bachelor's programs are very unusual. EPFL essentially favors admission to the Master's cycle of candidates holding a Bachelor's degree.

The Master's program

Recruitment to the Master's program

Applicants to the Master's program are essentially international (see Annex CV.IV-1: "Indicators November 2013", p. 45-54 and figure DIII-II). Recruitment is focused on quality rather than quantity, and this quality is required both when it comes to education (renown of the school of origin, reputation of this school according to areas of expertise, institutional partnerships...) and the level of student performance (grades, relative positioning in their class, academic record, projects, internships, publications, letters of reference and motivation...). The goal is to select external candidates who provide a real added value for the dynamics of the school.

Excellence fellowships for the Master's program

With the support of partners, EPFL offers a limited (but growing) number of Excellence fellowships for Master's students with academic achievement of the highest level. All students have the possibility to propose a candidate for a fellowship grant when applying for the Master's program. Each grant consists of a sum of CHF 16,000 per academic year (i.e., a maximum of CHF 32,000 for a two-year Master's program) for external candidates, and CHF 10,000 (payable in two installments)

with a certificate of Excellence for internal candidates (who have a Bachelor's degree from EPFL). Companies through special partnerships fund some of these grants: Novartis, PWC, etc...

Admission to the Master's program

Any student who holds a Bachelor's degree (or equivalent) in a related field from a recognized university may submit an application for the master's program, but for non-EPFL students, admission is competitive. Only candidates demonstrating excellent academic results and that have excellent references are likely to be accepted.

EPFL students at the end of the Bachelor's program are enrolled automatically in the master's cycle of their field of study and do not need to carry out the application procedure to continue in the same branch of study. If they change their field of study and become interested in, for example, a specialized Master's subject (Management of Technology, Financial Engineering, Energy Management and Sustainable Building, Nuclear Engineering, Computational Science and Engineering), they are required to go through the application procedure just like all other external candidates.

Case of Swiss HES graduates: Graduates of University of Applied Sciences (HES) are admitted to EPFL's Master's programs in Architecture, Civil Engineering, Environmental Science and Engineering, Chemistry, Chemical Engineering, Electrical Engineering, Mechanical Engineering, Microtechnology, IT and Communication Systems, if they have obtained their degree in the same field. However, they first have to perform a gateway year of 60 ECTS credits. The details of this gateway year should be discussed directly with the section in question.

Selection of candidates: The selection of candidates for the Master's program is made based on the qualifications of each applicant by an admissions committee, which gets together twice a year (a winter session and a spring session). The Vice-president for Education, or his Deputy, chairs the committee. Are also present school representatives of the sections, a representative of the International relations office, and a representative from the study programs promotion. It is managed by the Registrar's office. Applications received and centralized at the Academic Services are submitted to the sections, which in turn perform a pre-selection of files according to their specific criteria (adequacy of the prerequisites, competence clusters from the schools of origin, quality of the qualifications, previous experiences with students from the same schools, expertise and contact networks of the teachers...). Members of the Master's admissions committee proceed to the validation and final acceptance of the pre-selection reviews done by the sections. This last selection takes place on the basis of strict institutional recruitment criteria and with a commitment to harmonize requirements.

Doctoral program

Recruitment to the doctoral program

Applicants to the doctoral program are in large part international (see Annex CIV.IV-I "Indicators November 2013", p. 69-77 and figure DIII-III).

The Doctoral School oversees 18 doctoral programs covering all fields studied at EPFL. Each program is responsible for the recruitment of its doctoral students, as well as the organization and supervision of their curricula. The doctoral programs offer advanced courses and stimulate the emergence of a scientific community in a specific field. The first step in selecting doctoral candidates is evaluating their application files; admission is highly competitive. Each doctoral program has a committee that meets 2-3 times a year and that makes recommendations, sets admission criteria and directives for the candidates. Generally, applicants must apply to the program of their choice within the time limits set by it. However, some programs may propose positions in the context of specific research opportunities.

The vast majority of the [PhD students](#) admitted to EPFL are employed and paid as "assistants-PhD students". They work on their research, participate in educational tasks and contribute to the smooth functioning of their research unit. They have a double status as a student and an employee. For more information on doctoral programs, please refer to Chapter F.

The official statistics for the Admissions to EPFL for the year 2017 is indicated on the next page

EPFL: Statistique officielle des étudiants

1.1 Nouveaux étudiants immatriculés (ANNEE CIVILE: semestre de printemps 2017 et semestre d'automne 2017)

Sections	Etudiants						Femmes	Etrangers	
	CMS	Bachelor	Master	Doctorants	Formation continue	TOTAL		non résidents	résidents
CMS	152					152	36	64	10
CMS	152					152	36	64	10
Chimie et Génie chimique		93	34	63		190	74	138	10
Mathématiques		137	24	23		184	59	116	2
Physique		210	35	43		288	69	186	11
Total SB		440	93	129		662	202	440	23
Génie électrique et électronique		105	97	60		262	57	231	4
Génie mécanique		322	42	22		386	66	278	6
Microtechnique		258	29	53		340	65	177	16
Science et génie des matériaux		70	27	41		138	52	108	1
Total STI		755	195	176		1126	240	794	27
Informatique		267	73	60		400	71	282	7
Systèmes de communication		82	22	6		110	25	76	3
Total IC		349	95	66		510	96	358	10
Architecture		242	20	23	3	288	161	123	14
Génie civil		118	32	22		172	42	95	3
Sciences et ing. de l'environnement		109	12	15		136	69	65	3
Total ENAC		469	64	60	3	596	272	283	20
Sciences et technologie du vivant		241	68	61		370	197	248	14
Total SV		241	68	61		370	197	248	14
Ingénierie financière			22	4		26	6	24	
Management de la technologie			35	6	113	154	56	134	5
Total CDM			57	10	113	180	62	158	5
Gestion de l'énergie et construction durable			8			8	2	8	
Total EME			8			8	2	8	
Humanités digitales			4	1		5	2	4	
Total CDH			4	1		5	2	4	
Total 2017/2018	152	2254	584	503	116	3609	1109	2357	109
Total 2017/2018 sans CMS						3457	1073	2293	99
Total 2016/2017	157	2021	570	447	132	3327	993	2058	152
Total 2016/2017 sans CMS						3170	952	1986	144

Comprend tout nouvel étudiant admis à l'école dans la période considérée, y compris échanges (dans bachelor), hors cadres (dans master)

1.2 Étudiants immatriculés (semestre d'automne 2017)

Sections	Etudiants						Femmes	Etrangers	
	CMS	1ère année	Bachelor (avec 1ère année)	Master	Doctorants	Formation continue		non résidents	résidents
CMS	153						153	36	64
CMS	153						153	36	64
Chimie et Génie chimique		(94)	219	154	260		633	236	387
Mathématiques		(161)	339	157	78		574	140	315
Physique		(249)	493	170	220		883	195	492
Total SB		504	1051	481	558		2090	571	1194
Génie électrique et électronique		(69)	172	171	261		604	118	457
Génie mécanique		(358)	753	268	114		1135	149	709
Microtechnique		(348)	664	226	204		1094	201	545
Science et génie des matériaux		(65)	140	127	163		430	130	287
Total STI		840	1729	792	742		3263	598	1998
Informatique		(238)	484	320	157		961	135	545
Systèmes de communication		(97)	301	169	77		547	98	332
Total IC		335	785	489	234		1508	233	877
Architecture		(238)	820	311	84	9	1224	589	393
Génie civil		(125)	278	227	97		602	127	288
Sciences et ing. de l'environnement		(119)	256	110	93		459	208	211
Total ENAC		482	1354	648	274	9	2285	924	892
Sciences et technologie du vivant		(277)	550	276	268		1094	569	610
Total SV		277	550	276	268		1094	569	610
Ingénierie financière			62	22			84	22	71
Management de la technologie			80	41	185		306	94	245
Total CDM				142	63	185	390	116	316
Gestion de l'énergie et construction durable				42			42	9	30
Total EME				42			42	9	30
Humanités digitales				11	3		14	4	8
Total CDH				11	3		14	4	8
Total 2017/2018	153	(2438)	5469	2881	2142	194	10839	3060	5989
Total 2017/2018 sans CMS							10686	4742	8490
Total 2016/2017	157	(2507)	5418	2801	2124	193	10693	2968	5668
Total 2016/2017 sans CMS							10536	2927	5596

Les étudiants d'échange sont compris dans le bachelor et les hors cadres dans le master.

Dans les études de bachelor-master,

26 étudiants supplémentaires ne sont pas comptabilisés car en échange, provenant d'une autre haute école suisse.

Parmi les étudiants Bachelor 1ère année, 10 ne sont pas présents mais en congé.

Dans la formation continue,

25 candidats supplémentaires ne sont pas comptabilisés car à temps partiel (CAS ou DAS).

E. GRADUATE EMPLOYMENT

(This general presentation, which avoids subsequent redundancies, is further broken down for each section)

E.1. ANALYSIS OF ENGINEERING PROFESSIONS AND JOB MARKET

EPFL has an organized approach to surveying and analyzing the development of the job market and the employment of engineers following both their master and Doctoral graduation. In this way it can inform EPFL Senior Managements and program Directors on the level of employability and level of satisfaction of the Alumni (see specific report in the annexes).

Every year, the Career Center at EPFL publishes a report on the employability of its graduates (from the Master's, and Doctoral programs) 2 years after they have obtained their diploma. The survey is generally conducted between August and September, which is a hollow period in the academic calendar. [The last 3 annual surveys \(in French\) performed by our CC with their findings are available here.](#)

This survey covers different areas:

Masters Survey

- Main indicators of the professional integration of graduates Master
- Job search
- Type of jobs held
- Wages
- Skills acquired in connection with the position
- Satisfaction at work
- Graduates looking for work
- Summary of key indicators by section
- Evolution of the main indicators over time
- PhD students
- Entrepreneurs

PhDs Survey

- Main indicators of the professional insertion of doctors
- Job search
- Type of jobs held
- Wages
- Skills acquired in connection with the position
- Satisfaction at work
- Graduates looking for work
- Entrepreneurs
- Summary of the main indicators by Doctoral School
-

These surveys, which are annually presented in an executive session, provide a comprehensive review of the employability of graduates from EPFL. However, since the response rate of graduates to the CC questionnaires send to them by mail tends to become smaller over the years (as noticed already by Cti in 2014), the directions of programs have been asked to support this important action, on their side. This wants that sections involve themselves to also collect such important information on their own alumni, either by mail, or via their LinkedIn page (see sections reports).

E.2. PREPARATION FOR EMPLOYMENT

The EPFL's Career Center acts as a bridge for students between EPFL and the job market through [specific events](#), [training sessions](#), and available [written instructions](#).

This is the second important mission of the CC providing an active support and preparation to students in the first steps to the entrance on job market and professional career. As illustrated bellow, not only it advises and coach students, but also attracts and encourages employers to come and visit EPFL for the recruiting of school's graduates on the occasion of [specific events](#) (<https://forum-epfl.ch>).

The Career Center accompanies the EPFL students in their academic orientation and employability by providing a range of services covering different kinds of needs. These services listed on the website of CC are organized each year, including those with special events. Below are the details of the services offered in 2017 - 2018.

1. [Courses, Seminars, and workshops:](#)

- a. [Workshop](#) " Crafting an effective industry application,).
- b. "Le dossier de candidature en industrie".
- c. Workshop "acing your job interview".

2. [Individual and Group and Services:](#)

- a. Regular students and PhD candidates of EPFL are eligible for individual appointments with a Career Center advisor for matters related to their entry in the workplace, and for assistance with their job search. In case of high demand, priority is given to students in their final year and to recent graduates.
- b. Introduction to [recruitment platforms](#)
- c. Introduction to the EPFL LinkedIn Alumni network

3. [Industrial Round Tables](#)

- a. information and contact sessions with representatives of employers having graduated from EPFL.
 - *Production, Logistics, and Quality Assessment*, November 2016
 - *Working in cooperation and development*, April 2017
 - *The Added Value of a PhD on today's job market*, October 2017
 - *"Has working for the State become "passé "?, November 2017.*
 - *"Is being an employee equal to being a "slave for life "?, March 2018*
 - *Does the Swiss watchmaking industry still need engineers ?, May 2018*
- Such Industrial Round Tables attracted over 80 students per session

4. [Employer services:](#)

Mailshots (Graduates) :

We will mail your job advert to targeted graduating students and recent graduates

Job adverts posting (Alumni)

Job offers can be posted on our Alumni's online Job Board: [JobsForBrains.ch](#). This is ideal if you want to hire an EPFL engineer with experience, but it may as well be used to attract recent graduates, as they also check the board regularly. We also offer to publish your ad on ETHZ's job board simultaneously, at a reduced price.

Company presentations

We organize all the logistics of your on-campus company presentation at your date of choice and we promote it towards our students.

On-campus Recruitment Days

Based on your job description, we collect and pre-select applications (from graduate, final-year and PhD candidates) on your behalf and we schedule on-campus interviews with the applicants you have short-listed. Two dedicated interview rooms are at your disposal for the Recruitment Day, or for a longer time if necessary (additional fee applies).

Active profile search

We will search and identify candidates among EPFL graduating students, recent graduates and Alumni that best match that a given industry would need. The CC office can provide on request a selection of student profiles fitting with the industry demand.

EPFL Masters graduation schedule

An up-to-date Master graduation schedule, presented by month and by Master program, is downloadable from the CC website

5. [Sponsorships.](#)

In order to increase your visibility with our students, we propose a limited number of sponsorships every year. Official sponsors get a stylish plaque at the Career Center's entrance and their logo on [our website](#). Sponsorships also include recruitment services.

6. [Forum EPFL:](#)

Founded 35 years ago by students, the EPFL Forum is one of the largest Recruiting Events in Switzerland. The concept, more and more present in the life of the universities, aims to bring students and professionals together in one place, in order to encourage exchanges and recruitment. The meeting of the two communities, on the EPFL campus, allows graduating engineers to make their first contact with the world of employment every year.

It proposes, presentation desks for companies, workshops, interview rooms, and is supported both by EPFL and sponsors from industry.

In 2017, 170 companies were present, and 17'000 visitors attended the Forum. The level of satisfaction, as evaluated by a specific questionnaire both to students and companies, revealed a very high level of satisfaction.

EPFL students are prepared through seminars on the way to take best advantage of such event.

7. [Support of the EPFL alumni association:](#)

Finally, [EPFL's alumni association](#) provides, in part with the support of CC, various support actions to facilitate the employability of its graduates. It has, in particular, internationally active chapters.

E.3. EMPLOYMENT and EMPLOYABILITY ANALYSES (see also E.1)

Since the CC has the opportunity to discuss regularly with employers of EPFL graduates to have their feedback, which are usually very positive, it does not do *stricto sensu* a survey of employability per se as [APEC does](#) in France. However through its Employer service desk (see above) it has a kind of reflection of the frequency of the profiles, which are requested more frequently.

Traditionally, both EPFL and ETHZ has relied on the information provided on this topic by our [Federal Office of Statistics](#), which follows the job market for all universities in Switzerland (see figure E.1-I and II-III on next pages).

Such information is also gathered at the level of program directions through their meetings with their specific industry advisory boards. This can be seen in the specific PV documents provided to the experts during their visit of the program directions. Indeed, suggestions and feed-backs obtained on these occasions serve also this purpose, in addition to, if necessary, the program learning outcomes towards the expectation of the job market.

Along the same line, programs will report their own evaluation of the success of employability and categories of jobs that their students were offered after graduation.

STATISTICAL ANALYSIS OF EMPLOYABILITY AND JOB MARKET AS CONDUCTED BY THE FEDERAL OFFICE OF STATISTICS

Benchmark of the employment rate of EPFL students with those of ETHZ, and Attractivity of Technology-oriented Professions with Respect to Other Field of Study on Job Market as shown by a study made by our Federal Office of Statistics

Occupancy rate of Heigher Education graduates by level of examination, University, and field of study group
Situation in 2015, **five years after graduation**, (year of graduation 2010)

		Master						Doctorat					
		< 50%		50% - 89%		90% - 100%		< 50%		50% - 89%		90% - 100%	
		%	+/-	%	+/-	%	+/-	%	+/-	%	+/-	%	+/-
EPF de Lausanne	Sciences exactes + naturelles	3.7	3.3	12.8	5.4	83.6	6.2	0.0	0.0	20.0	11.2	80.0	11.2
	Sciences techniques	2.1	1.9	10.5	4.3	87.4	4.6	0.0	0.0	17.3	8.4	82.7	8.4
EPF de Zurich	Sciences humaines + sociales	**	**	**	**	**	**	**	**	**	**	**	**
	Sciences exactes + naturelles	1.6	1.4	24.4	4.3	74.0	4.5	3.2	2.4	18.0	6.3	78.8	6.5
	Médecine + pharmacie	3.5	4.8	40.8	13.8	55.7	14.0	**	**	**	**	**	**
	Sciences techniques	1.6	1.1	16.5	3.7	81.9	3.8	5.1	3.3	22.3	6.2	72.6	6.7
	Interdisciplinaire + autres	13.9	9.6	46.3	14.1	39.8	13.9	**	**	**	**	**	**

** : less than 25 answers

Occupancy rate of Heigher Education graduates by level of examination, University, and field of study group
Situation in 2011, **one year after graduation**, (year of graduation 2010)

		Master						Doctorat					
		< 50%		50% - 89%		90% - 100%		< 50%		50% - 89%		90% - 100%	
		%	+/-	%	+/-	%	+/-	%	+/-	%	+/-	%	+/-
EPF de Lausanne	Sciences exactes + naturelles	5.4	2.8	12.6	4.2	82.0	4.9	0.0	0.0	4.8	4.0	95.2	4.0
	Sciences techniques	1.5	1.2	7.8	2.7	90.6	2.9	3.9	3.2	14.7	6.5	81.4	7.0
EPF de Zurich	Sciences humaines + sociales	**	**	**	**	**	**	**	**	**	**	**	**
	Sciences exactes + naturelles	2.3	1.0	36.5	3.5	61.2	3.5	1.8	1.3	9.6	3.1	88.6	3.4
	Médecine + pharmacie	0.0	0.0	38.6	9.4	61.4	9.4	**	**	**	**	**	**
	Sciences techniques	0.5	0.4	13.0	2.3	86.5	2.3	1.2	1.1	14.5	3.9	84.2	4.0
	Interdisciplinaire + autres	14.4	6.4	39.1	9.2	46.5	9.4	**	**	**	**	**	**

** : less than 25 answers

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<https://www.bfs.admin.ch/bfs/fr/home/statistiques/education-science/integration-marche-travail/tertiaire-hautes-ecoles/taux-occupation.html>

**FIGURE E.1 - | RATE OF EMPLOYMENT OF EPF ENGINEERS IN SWITZERLAND ACCORDING TO
THEIR LEVEL AND TYPE OF TRAINING, **ONE**, AND **FIVE YEARS AFTER GRADUATION****

Under- / over-employment of University Graduates by Level of Examination and Field of Study Group

		Taux d'occupation adéquat		Sous-employé/e		Sur-employé/e	
		%	+/-	%	+/-	%	+/-
Bachelor	Sciences économiques	86.8	2.9	4.3	1.8	8.9	2.5
	Droit	85.9	6.4	4.6	3.7	9.5	5.4
	Sciences exactes + naturelles	81.4	4.8	10.7	3.9	7.9	3.3
	Sciences techniques	79.2	8.7	2.9	3.4	17.9	8.3
	Total	78.1	1.6	9.1	1.1	12.8	1.3
	Sciences humaines + sociales	73.2	2.3	11.6	1.7	15.2	1.9
	Interdisciplinaire + autres	69.5	7.7	12.2	5.4	18.4	6.5
Master	Sciences économiques	88.7	1.3	3.6	0.8	7.6	1.1
	Sciences techniques	85.7	1.5	2	0.6	12.3	1.4
	Médecine + pharmacie	82.3	1.7	4	0.8	13.8	1.6
	Total	80	0.6	8.3	0.4	11.7	0.5
	Droit	79.5	1.9	6.2	1.3	14.3	1.6
	Sciences exactes + naturelles	78	1.4	10.9	1.1	11.1	1.1
	Interdisciplinaire + autres	74.1	3.9	14.9	3.1	11	2.8
	Sciences humaines + sociales	73	1.3	14.5	1	12.5	0.9
Doctorat	Sciences économiques	92	4.1	0.9	1.2	7.1	3.9
	Sciences techniques	85.2	2.8	3.5	1.5	11.3	2.5
	Sciences exactes + naturelles	83.3	2.1	7.1	1.5	9.6	1.6
	Droit	83.1	6.2	8.6	5.1	8.3	4.1
	Total	81.4	1.3	6.9	0.9	11.7	1.1
	Médecine + pharmacie	79.1	3.1	3.1	1.4	17.9	2.9
	Sciences humaines + sociales	72.6	3.5	15.8	2.9	11.6	2.4

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**: moins de 25 cas

Renseignement: absolventen@bfs.admin.ch

FIGURE E.1 – II RATE OF EMPLOYMENT BY FIELD OF STUDY, AND LEVEL OF TRAINING

<https://www.bfs.admin.ch/bfs/fr/home/statistiques/education-science/integration-marche-travail/tertiaire-hautes-ecoles/taux-occupation.html>

Occupancy rate in Switzerland of EPF engineering graduates by level of study examination and field of study group Situation one year after graduation, year of graduation 2014

		Master						Doctorat					
		< 50%		50% - 89%		90% - 100%		< 50%		50% - 89%		90% - 100%	
		%	+/-	%	+/-	%	+/-	%	+/-	%	+/-	%	+/-
EPF de Lausanne	Sciences exactes + naturelles	6.1	2.2	5.3	2.2	88.6	3	6.7	3.5	10.5	4.5	82.9	5.4
	Sciences techniques	1.7	1	6.4	2	91.9	2.2	0.7	0.9	11.3	4.2	87.9	4.3
	Interdisciplinaire + autres	**	**	**	**	**	**
EPF de Zurich	Sciences humaines + sociales	**	**	**	**	**	**	**	**	**	**	**	**
	Sciences exactes + naturelles	4.2	1.2	14.6	2.3	81.2	2.6	0.6	0.7	10.3	3.1	89.2	3.2
	Médecine + pharmacie	5.6	4.4	25.6	8.4	68.8	8.9	**	**	**	**	**	**
	Sciences techniques	0.8	0.4	9.7	1.6	89.5	1.7	2	1.4	14.5	3.6	83.5	3.8
	Interdisciplinaire + autres	10.9	6.3	30.8	9.6	58.3	10.2

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..: Pas d'observation.

**: moins de 25 cas

Renseignement: absolventen@bfs.admin.ch

FIGURE E.1 – III RATE OF EMPLOYMENT ACCORDING TO THE LEVEL OF TRAINING, (graduation 2014)

<https://www.bfs.admin.ch/bfs/fr/home/statistiques/education-science/integration-marche-travail/tertiaire-hautes-ecoles/taux-occupation.html>

F. QUALITY ASSURANCE AT SCHOOL LEVEL

F.1. INTERNAL QUALITY ASSURANCE POLICY

The Quality Assurance in higher education in Switzerland has recently been re-defined in the new Federal Act on Funding and Coordination of the Swiss Higher Education Sector (HEdA). Switzerland is now endowed with an instrument designed to control access to its range of higher education (HE) institutions. EPFL, as all public or private HE institutions wishing to keep or obtain the right to use the reserved designations “universities” in Switzerland, or to receive federal contributions, must undergo Institutional Accreditation.

Quality Assurance in Swiss Universities is also integrating the European policy arising from the Bologna Process. Hence, the European Standards and Guidelines (ESGs) edited by the European Association for Quality Assurance in Higher Education, the ENQA, constitute most of the underlying spirit for the organization of the Quality Assurance policy at EPFL. In the new Federal Act, and its related guidelines, quality standards have been, however, somehow adapted to the specificity of the Swiss HE Institutions and the federal context by our government. Moreover, concerning both Swiss Institutes of Technology in Lausanne and Zürich, QA is also expressly included in the services mandate of the Federal Board under the EPF domain, conferring to our policy and related QMS a global approach with the highest standards capable to guarantee a valuable support to the strategic positioning of our schools.

Domain

EPFL's quality assurance system covers, in particular, the following key activities and major tasks of EPFL that are developed in the following chapters:

- a) **Management and strategy**, reaching its goals, items see items.
- b) **Education**, divided into QA of teaching and programs
- c) **Research**, including the quality assurance of the PhD program, see items F.4.
- d) **Innovation and Technology Transfer**: this performance is audited, though not always, during School evaluations. However, the Vice-President for Innovation and Technology Transfer conducts an annual reporting (see item B 2.2). This mission has been, for the first time, submitted to a comprehensive evaluation within the ETH domain as requested by SEFRI in its reporting to the Federal Council on the objectives of the 2012-2016 performance mandate.

F.2. - INTERNAL QUALITY ASSURANCE IMPLEMENTATION

F 2.1 Organization

Quality appears in the missions of [the Presidency](#) (see A.3.2) and is attached to the Secretary General. EPFL's management has appointed in September 2013 a Quality Delegate, with the title of professor and former program director. He reports directly to the Presidency to the General Secretary and conducts, with the different internal stakeholders, the different processes aiming to spread a culture of quality in all EPFL entities and services. The monitoring of quality cases, in particular when it comes to education, research, and infrastructures is subject to discussion and direct implications of the respective Vice-presidencies, which determine the team responsible to implement their specific strategy for quality assurance under the supervision of the quality Delegate.

The tools available to the QMS of EPFL are mainly the following:

- a) *When it comes to the institutions (strategy and management):*
 - reporting by EPFL to the ETH Board with regard to achieving the goals set out in the convention of objectives from 2017 to 2020;
 - 1. intermediary and final evaluation of the achievement of the Strategic Objectives by SEFRI.
 - 2. evaluation of the faculties and colleges of EPFL by external peer review with reporting to the ETH Board.

b) When it comes to the education:

3. teaching evaluation by the students,
4. program evaluation by the academic committee,
5. program evaluation by the advisory committee,
6. program and teaching assessment by the education committee, and alumni surveys,
7. as well as the definition of the learning outcomes of the program and the implementation of learning outcomes of the teachings, respectively the establishment of a competences matrix which is a key element of operational management of the education.
8. Evaluation of EPFL general strategy for teaching by the Council of EPFL Teachers ([CCE](#))

c) When it comes to research:

9. evaluation of the EPFL School and Colleges,
10. external and internal quality assurance of EPFL's research,
11. annual reporting by the dean of research to the management by using ad-hoc indicators,
12. academic rankings,
13. quality assurance of PhD programs.

d) When it comes to internal and external stakeholders: satisfaction survey to students, PhD students and EPFL employees, satisfaction survey to new graduates (on an annual basis) and graduates up to 5 years after the end of their studies (periodicity of 5 years, survey conducted during evaluations of the faculties and colleges). The opinion of external stakeholders is not only formally obtained from advisory committees of institutes for research and sections for education, but also in terms of strategic advice from the faculties and from members of the ETH Board.

Focus on Some Systems Also Participating to EPFL Quality Assurance

Related key EPFL processes and quality activities reinforce the implementation of EPFL QMS, as well as the quality culture of the institution without being formally integrated.

○ **Sustainable development:**

- EPFL provides a periodic report on [sustainable development](#), established according to the guidelines of the [Global Reporting Initiative](#).
- In addition, EPFL has signed the [ISCN/GULF Sustainable Campus charter](#).

○ **Risk management:** risk management was introduced at EPFL by the ETH Board with its legal basis. It is under the responsibility of the VPFSI:

- Council Directive concerning the ETH and [risk management](#) for the ETH and Research Institutions;
- [Ordinance](#) on the organization of EPFL
- Guidelines of Organization of [Risk Management](#) at EPFL;
- Organization of Risk Management and its committee: The CRM consists of four members and is advised by two representatives of the academic field. They bring academic expertise, especially for risk analysis of strategic domains and of Schools and colleges. The CRM coordinates and supervises the activities of seven committees attached to it.
- *The mission of the CRM is to:*
 - implement the risk management policy at EPFL in accordance with the Directive of the ETH Board on risk management;
 - develop an organization and procedures to ensure legal compliance;
 - ensure the identification of risks and the implementation of measures to reduce them to an acceptable level;

- ensure that the people involved with risks manage them, communicate them to the CRM and regularly perform critical verifications.
 - oversee the insurance program and adapt it to the needs;
 - encourage individual actions and initiatives to improve the management of risks and opportunities at EPFL;
 - report to the President and the EPFL management on an annual basis and regularly on the status and the progress of cases related to risk management.
- The extent of the EPFL's risk management includes the campus of Lausanne, Neuchâtel, Geneva, Sion (Valais) and Fribourg as well as all stakeholders (public and private partners, bodies of research funding, sponsors, donors, ordinary partnerships, foundations, associations, media).
- The **EPFL information system (IS)** is an essential asset, which contributes to its objectives. A special attention is given to IS security. IS security team consists of 3 collaborators. Its aim is to ensure the business continuity and to protect EPFL reputation. **EPFL IS security is inspired by ISO/IEC 27000 series and the [Information System Security Policy](#) is its cornerstone.** Risk analysis, audit recommendations follow-up, intrusion tests and incident management are some tools used in this context. On the June 2014, EPFL management approved a new directive concerning use of IT resources. An information classification directive and an IT general controls inventory are being developed.
 - **Safety Prevention and Health Domain:** Since July 2011, the Security Service of EPFL then known as SHE (Safety, Health and Environment) has become the DSPS ([Safety Prevention and Health Domain](#)). These three main pillars summarize the different actions to be taken and implemented to ensure the safety of the staff and infrastructures on the site of the EPFL. The mission of the Safety, Prevention and Health Domain on the EPFL campus is to ensure the following services:
 - **Safety:** Safety and security tips and analyzes, management of all EPFL emergencies, policy contingency and events (security tips and concept), firefighters and rescue workers.
 - **Prevention:** Compulsory Basic Safety Training for all new hired EPFL staff (FOBS), specific training for security correspondents (COSECs), specific training for the use of certain equipment, identification of chemical, biological and physical hazards in the units and rooms of the school (cadaster of the hazards), audits and checks, incident and accident handling, prevention campaigns (Help Network), actions and follow-up of the construction projects.
 - **Health:** Ensure medical monitoring of employees, advice on health and hygiene in the workplace (MSST), training of Samaritans and Samaritans teams, monitoring of occupational exposure, taking into account the occupational diseases, the presence of a Health Point with nurses of the Policlinic Medical University (PMU) allowing the EPFL population to have access to an active medical center for a first anamnesis, care and prevention.

F 2.2 Strategic rationale of EPFL Quality Assurance (summary)

Continuous Improvement within EPFL

The EPFL quality assurance was essentially finalized and improved under the guidance of Dr. Michel Jaccard, the former Delegate for Quality at EPFL, in view of the successive evaluations jointly done by OAQ and Cti in 2006, 2010, and 2014 for the quality audits and programs accreditation. In addition to the obligation for all Swiss universities involved in higher education to install a quality assurance system, as mentioned in the new [Higher Education Act, \(art.30 HEdA\)](#), the major motivation for adopting EPFL current strategy was, in the first place, the demonstration that QA implemented at the level of the different entities of EPFL provided useful information for the continuous improvement of a culture of quality for the different EPFL activities. In summary, here are the main points:

- a) **For education**, indicative and in-depth assessments of the delivered teachings proved to provide useful information both for the professors and the sections, in order to correct any non-conformity into expected competences (education, coordination between courses

or sequences in the program). As measure for improvement, a substantial offer of course seminars, tools and personalized assistance were put in place by **CAPE**, and since then facilitates the achievement of this goal and can provide optimal support to any professor wishing to improve the quality of his teaching.

- b) **For the programs**, the information provided by the academic boards and advisory committees of the sections, global surveys (*i.e.* Campus I/II, Doctorants /II and ATMOS I/II, as well as remedial measures ensuing from them, and those conducted on new graduates or on alumni), School evaluations, the use of a new computerized grid for program management (included in IS Academia) according to expected competences based on learning outcomes (recently developed by the EPFL Quality Unit), have been able to gathering valuable elements for the implementation of continuous improvement of various Bachelor/Master courses and programs. Hence, on the same line, EPFL takes into account the recommendations of the OAQ/Cti accreditation audit in November 2014.
- c) **For research**, its constant monitoring done by annual reporting of the School deans and that developed centrally by the VPR, and the results of periodic School audits and remedial action programs resulting from them, constitute valuable instruments for its continuous improvement. These measures also guide *the strategies of the Schools and their daily management*, and have also an impact on *the strategic planning for recruiting faculty professors*.
- d) **For EPFL's global strategy**, which in the EPFL convention of objectives is delineated into achievable goals for the planning period; the monitoring and any possible adjustments are described in the item A 1. Imperfectly achieved goals, if they do not become obsolete, may be reworked during the drafting of the next period's convention of objectives. Note also the contribution of the internal surveys to improve the daily functioning of the technological university.
- e) **For the ETH Domain**, the objectives contained in the Strategic Objectives mandate, besides the annual reporting of the ETH-Board to the Federal Council, are subject to intermediary and final evaluations, and the final report is submitted to the SEFRI, as well as to the two

F 2.3 Internal Communication of the Quality Assurance Process

The quality assurance process is communicated:

- a) in the explicit [missions](#) of the Presidency through its Secretary General
- b) for the overall processes, at the following web pages:
 - a. [Accreditations and quality assurance](#) of the bachelor and master programs.
 - b. [Evaluation of Schools and Colleges](#).
- c) The EPFL surveys of internal stakeholders (Campus II, Doctorants II, Atmos II) are available on the EPFL website (see also F 1.3). Their results were published in the monthly EPFL journal "Flash" and presented in many seminariums such as for the EPFL Senior Management meetings, School Assembly, The [Council of EPFL Teachers](#) (CCE), Commission of the Directors of Programs (CDS), meetings of EPFL's department heads, etc.)

Results associated to b) and c) are also presented to the ETH Board.

F 2.4 Reporting on the Processes and Results of Quality Assurance

The HEI ensures transparent reporting on the processes and results of quality assurance measures to the groups concerned within the HEI. The evidences are found mostly in the various sections of chapter F.

F.3. SPECIFIC QUALITY ASSURANCE IMPLEMENTATION

F.3.1. TEACHING

Globally, the Program director is supported by a quality system that includes:

- The **evaluations by students** correspond to the student's satisfaction for different learning activities. Another aspect is the peer review of the teaching, assuring the coherence of the study plan as well as its correspondence to the needs of the future employers. Three committees help the sections directors in these reviews:
- The **teaching committee**, including all involved teachers, discusses the challenges and opportunities encountered in the education offer. It looks at the synergies between courses and proposes curriculum evolution.
- The **advisory committee** reflects the needs of employers. It helps to define the main directions of evolution and the requirements of industry.
- The **academic committee** is responsible for verifying the quality of courses and examinations, in particular for ensuring that the learning objectives are achieved. It contains an external expert usually from ETH Zurich, together with well-established professors of the section.

F 3.1.1. Teaching Evaluations at EPFL

▪ Overview

The quality of teaching is based on a dual approach involving: (a) ensuring that all courses meet certain minimum standards and, (b) supporting all teachers in developing, testing and deploying innovations in pedagogical terms. As part of the focus on continuous improvement of the teachings and the programs, professors and sections are therefore encouraged to evaluate and develop their courses every semester. In doing so they are informed by feedback from the students and from the team of [the Teaching Support Center at EPFL \(CAPE\)](#).

This comes in a number of forms:

- **Student evaluation of teaching:** Quick feedback (~ smoke detector) through an indicative evaluation: all courses have a short student evaluation of the teaching during week 9/10 of the semester.
- **More detailed feedback through:**
 - an in-depth evaluation, carried out by the section.
 - a complementary evaluation, carried out by the Teaching Support Center and accompanied by personalized feedback and support.

Mechanisms for student feedback to professors are described in more detail below, however, it is important to note that student feedback is not the only form of evidence that teachers can use to evaluate their own courses. Other evidence includes:

- A review of what students have learned (as evidenced in exam performances, for example)
- The professor's own experiences in teaching the course
- Feedback from colleagues or from a Teaching Advisor (e.g. following a class observation)

Student evaluations of the teaching are intended to be read in context and in conjunction with other forms of evidence.

▪ [Student Evaluations of the Teaching and related measures:](#)

As part of the focus on continuous improvement of teaching and of academic programs, lecturers and sections get feedback from students on courses. This comes in a number of forms:

- **Quick feedback (~ smoke detector)** through an indicative evaluation: all courses have a short student evaluation of the teaching during week 9/10 of the semester.

- **More detailed feedback through:**

- *an in-depth evaluation*, carried out by the section.
- *a complementary evaluation*, carried out by the Teaching Support Centre, and accompanied by personalized feedback and support to the concerned teacher.

It is important to say that students regard teaching evaluation as useful, and they feel that their input is taken seriously, as can be seen in next figure:

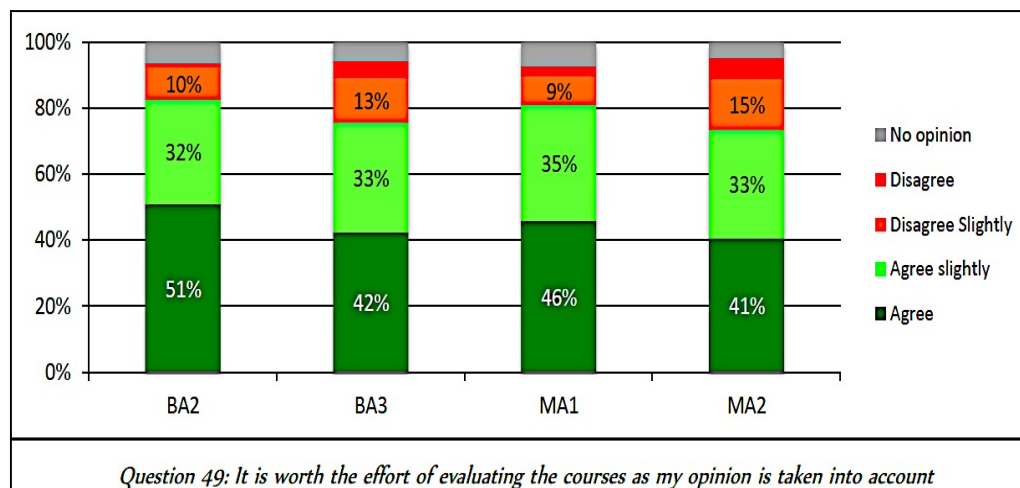


Figure F3.1-2: Student responses (2'584) to the statement "it is worth the effort of evaluating the courses as my opinion is taken into account. » [Note: Based on Campus II Survey, October 2012](#)

Quick Feedback: Indicative evaluation

An indicative evaluation of all Bachelor and Masters courses is launched automatically during week 9/10 of each semester (doctoral courses are also automatically evaluated, but, due to the differences in their format, another mechanism is used). In order to maximize the response rate in indicative evaluations, students express their level of agreement with a single statement: "Overall, I think this course is good". Students are also provided with an opportunity to leave comments. The response rate for the indicative evaluation is typically between 50% and 60%. About half of all student respondents also leave comments. According to the 2011 ATMOS II survey, 73% of teachers find the feedback from students useful.

Where more than 30% of respondents 'disagree' or 'strongly disagree' that a course is good, a detailed student feedback process is undertaken (see below). It is important to note that an indicative evaluation is simply an 'indication' - it is not a good overall assessment of a professor's performance or of a course; having more than 30% of students disagreeing that the course is good does not mean that there is a problem with a course per se, rather it means that the course merits closer inspection along with the section director.

Detailed Feedback: In-depth Student Evaluation

While the indicative evaluation provides regular feedback from a reasonably large proportion of students, more detailed feedback from students is also valuable. This is provided through in-depth evaluations involving a multi-dimensional student evaluation questionnaire, administered by the section. In-depth evaluations of the teaching are provided under three circumstances:

- an in-depth student evaluation of teaching is **required for all courses at least once every five years** (following a policy introduced in 2012).
- an in-depth student evaluation of teaching is **required for all new lecturers of a course**.
- where a course has an "insufficient" indicative student evaluation score, the section director is responsible for carrying out an in-depth student evaluation of teaching. The results of these in-depth evaluations are discussed between the lecturer and the section director, with a view to identify whether an issue exists and, if so, how it can be addressed.

Detailed Feedback: Complementary Student Evaluation

Any teacher can request a complementary student evaluation of teaching, supported by CAPE. This is carried on the initiative of the professor who wants to improve its teaching skills. He will then receive a specific guidance, and suggestion of good practices by a collaborator of CAPE.

CAPE: The Teaching Support Center

The evaluation of the teaching alone allows only a partial continuous improvement thereof, if it is not accompanied by the supporting activity of a teaching unit. This is the role of CAPE.

Mission

The Teaching Support Center ([CAPE](#)) is a unit attached to the VPE. Its mission consists in working with professors, sections and schools to support quality improvements of the teaching.

The Center accomplishes this through:

- One-to-one support, coaching, and advice to professors (for further [details here](#)).
- Personalized support to teacher following evaluation by students (further details [here](#)).
- Training workshops on higher education pedagogy (further details [here](#)).
- Managing the automated indicative evaluation system.
- Supporting development projects (such as the introduction of the new Course Description Interface, introducing Classroom Response Systems – [clickers](#), first year [tutorials](#), etc.).

Summary of CAPE's activity in 2017

The results of course evaluation showed that a vast majority of courses were considered good by a large majority of students: in the Spring 2017 semester, 84% of courses were identified as "good" by 70% of students or more, and in the semester of 'Autumn, this evaluation reached 87% of the courses.

For each course in which over 30% of students disagreed that the course is "good", sections organized a thorough evaluation and follow-up with the teacher. Hence, in 2017, 442 in-depth evaluations were conducted by the Teaching Support Center, very often for courses that were already considered positively by students, but which could benefit from further improvement.

In 2017, a pilot project of a cycle and program evaluation system was conducted in two sections. Following the success of this project, the system will be rolled out to all other sections in 2018.

The Teaching Support Center also provides support to teachers to develop and apply innovations informed by the results of research. In 2017, research projects on pedagogy and curriculum innovations were conducted in many sections.

Educational research and development on the integration of digital and "face-to-face" pedagogical approaches to this field of study has started in 2017 and will continue in 2018. Hence, a book and a [MOOC](#) (<http://go.epfl.ch/mooc-etudier>) based on the results of that research have been developed now for students and teachers on problem-solving skills in scientific fundamental disciplines.

F 3.1.2. Implementation of Learning Outcomes (see also section reports)

Since 2013, EPFL direction has decided to implement learning outcomes for the description and shaping of its programs, namely as "statements of what an engineer knows, understands and is able to do on completion of a learning process", in particular at the end of his engineer curriculum. Learning outcomes are now to be defined by teachers and sections at EPFL in terms of knowledge, skills and competence. However, we should pay attention that, as mentioned in their critical review on the implementation of learning outcomes in European higher education ([see D. Proli et al. ref](#))¹,

"in the absence of thorough techniques and methodologies able to ensure cohesiveness and consistency of the whole learning cycle, the substance of the learning outcomes approach is often dispelled in favor of a mechanical rewording of courses and certifications, thereby scattering its potential benefits".

¹ http://empleo.ugr.es/unilo/documentos/UNILO_ANALYSIS_OF_LOs_IMPLEMENTATION_with_annex.pdf

For this implementation, the following strategy was followed at EPFL in order to favor this challenging implementation and change of culture:

- a) The creation of a task force under the guidance of the Dean for education, was first established. Now the supervision and assessment of its implementation and continuous improvement is under the responsibility of the VPE assisted by the Teaching Support Center (CAPE) and the QA office.
- b) two different tools have been created to assist program directors in this task:
 - **an electronic interface** to facilitate the new culture of course description (F.3.2.1);
 - the introduction of a **computer-generated grid** indicating the intended competency profile obtained for a given program as a function of the cumulated course learning outcomes present in that curriculum (F.3.2.2).

Both tools are capable and expected to evolve according to the needs and feedbacks from program directors and our teaching community at EPFL.

F.3.1.3. Support for Professors in Writing Learning Outcomes

In 2013, EPFL adopted a new model Course Description Form requiring professors to describe their course content in terms of Learning Outcomes. An electronic interface was developed to enable professors to directly enter their Course Descriptions into IS-Academia, the EPFL academic database.

To maximize the value of the approach of learning outcomes in EPFL, the system was designed with four goals in mind:

- to encourage professors to use “observable” verbs in describing the goals of student learning in their courses
- to encourage professors to consider describing student learning in terms of mid-range cognitive functions (analyzing and applying), and higher cognitive functions (creating, synthesizing and critiquing) in addition to using verbs typically associated with lower-range cognitive functions (remembering and understanding).
- to encourage professors to consider whether their course teaches professional or cross-disciplinary learning outcomes (often linked to more affective, or interpersonal domains), in addition to subject-specific (cognitive and psychomotor) learning outcomes.
- to ensure that professors have the liberty to describe the learning outcomes of their own courses in a format and language that seems most appropriate to them.

To this end, the system includes:

- pre-defined (“observable”) learning outcome verbs, categorized in terms of lower-range, mid-range and higher-range cognitive functions (see the scrollable box with verbs on the upper right side of the image in figure F3.2-1).
- pre-defined cross-disciplinary / professional learning outcomes (see the scrollable box with cross-disciplinary skills on the lower right side of the image in figure F3.2-1).
- although encouraged to use these pre-defined elements, the system also leaves professors free to write subject-specific and cross-disciplinary learning outcomes in whatever form they feel most appropriate.

Regular (if modified) or new course descriptions must be completed by teachers during the summer and are validated by the relevant section.

To support professors in using learning outcomes in the description of their course, an on-line Course Description interface with the following supports are now in place:

- A website and demonstration video with information on [learning outcomes](#) and on the course description interface was made available in English and French.
- a personalized support service was put in place to aid professors in completing their Course Description.
- monthly updates on progress in completion of Course Descriptions was provided to Section Directors during the course of the project.

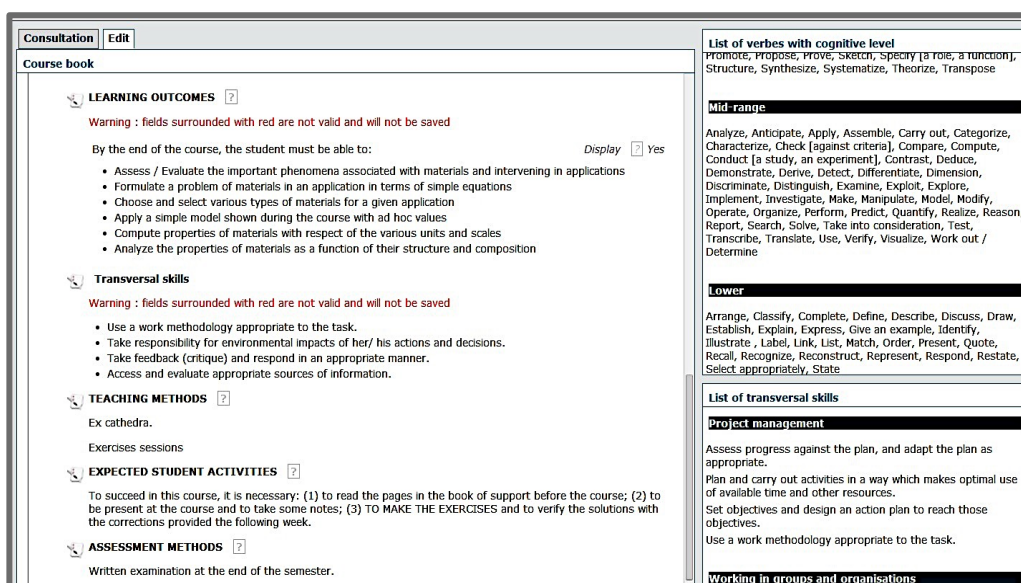


Figure F3.2-1: Screen grab of the course description interface, showing suggested verbs and cross-disciplinary skills.

In addition, a focus on using learning outcomes to provide guidance and on curriculum alignment underpins a number of the courses that are offered by the Teaching Support Center (such as course design, effective assessment and effective exercises). To measure the effect of such strategy, let's consider the evolution of LOs course description in 2013.

The number of learning outcomes in course descriptions was zero in Spring 2013. By November 2013, 11,957 English and French-language learning outcomes had been written for 1,192 courses (81% of all Bachelor and Masters courses). There were also 2,644 cross-disciplinary learning outcomes identified for 710 courses (48% of all courses). Since there are some courses in the database that are not taught every year, the effective completion rate of learning outcomes is actually higher than 81% (see table F3.2-2).

Table F3.2-2: Increase in the completion of learning outcomes in EPFL courses in 2013

	July 2013	August 2013	September 2013	November 2013
% of courses with learning outcomes included	31%	50%	75%	81%
Number of learning outcomes in French	2960	4743	5649	5933
Number of learning outcomes in English	2761	4718	5630	6024
Number of cross-disciplinary learning outcomes	1179	2106	2453	2644

Note: Based on data from the IS Academia academic database. The data represents the total number of learning outcomes for the 1,466 Bachelor and Master courses offered.

F.3.1.4. Grid for the management of programs according to the intended learning outcomes

Sharing again the views of D. Proli *et al.*, in their analysis of the difficulties encountered for the implementation of learning outcomes, we also believed at EPFL that this change in mentalities implied not only a re-thinking of learning paths in the direction of a more **“student-centered”** pedagogical approach, and a **real voluntary and organizational effort** to overcoming the well known specific “culture difference and thus resistance” that exist around departments and Schools.

In order to permitting the introduction of more flexible collaboration patterns, easy and quick alignment of the different programs, and their regular updating, we have thought to propose a new computerized grid system for the establishment of the **intended competency profile of our**

It is noteworthy to mention here that the intended competency profile for the current programs at EPFL is still organized today as the one adopted in 2014 for the joined accreditation made by the OAO/Cti.

Master in LST					Intended competency profile for the program in Life Sciences & Technology											
Orientation MOLECULAR MEDICINE AND SYSTEMS BIOLOGY					Scientific and technical knowledge and mastery of their implementation				Adaptability to the specific requirements of enterprises and society				Organizational, personal and cultural dimension			
					A	B	C	D	E	F	G	H	I	J	K	
					Knowledge and understanding of a wide range of fundamental sciences				Scientific and technical knowledge				Mastery of Engineering Methods and Tools			

In the part concerning the “*Acquisition of Scientific and Technical Knowledge and Mastery of their implementation*”, learning outcomes are also expressed according to the condensed version of the Bloom’s taxonomy proposed by the CAPE for the teachers’ course descriptions. Moreover, by asking the program directors to attribute specific colors to the disciplines taught during the courses, a flow chart between courses becomes immediately apparent. The use of colors permits at the same time to highlight the specificities or/and subspecialties within a program. Program directors have accepted to exercise it for the first time to present their programs for this OAQ/Cti review in 2014. A grid description with the formulation of the expected learning outcomes accompanies now the description of each program with this grid.

A propaedeutic board of program directors is in place and discusses the course contents and related performance assessment during exams. To insure a fair assessment of student learning outcomes at

the end of the 1st year, QCM are being introduced. The monitoring of student learning by the propaedeutic board has led to a new Education Supervision Ordinance, which came into effect in September 2016.

The ordinance indicates the introduction of an **upgrading course (MAN)** (see also A.2.4) in force since the spring semester 2017, dedicated to help those students who demonstrate to already loose their marks in basic sciences after the first weeks of classes. Moreover, statistics have shown that if not-well prepared students have scores less than 3.5 at the end of the first semester, their chances of success, at the end of the year, are indeed very low.

In the same line, new training technologies will also provide distance-learning tools for young people who would like to prepare for EPFL entrance. It is planned to put exercises and videos online to improve both the orientation and motivation of young people who plan to study sciences at the level of requirement of EPFL.

Bachelor and Master Cycles

In the bachelor and master cycles, the students' skills are tested in diverse ways. To the traditional written exams are gradually added oral exams, presentations and project reports, practical laboratory work, group work... The courses and projects in Humanities and Social Sciences (SHS) enable to test all the cross-disciplinary skills throughout the curriculum.

Each semester, the teaching commissions, including the academic commission (see F3 and also the specific comments in the documents of the sections under C), discuss and evaluate the courses, their quality and any problems encountered during examinations. Each exam is subject to a protocol written by the teacher and transmitted to the sections. An electronic reading of these protocols, examination statements and their answers is being implemented. Recently, academic commissions were also established to verify the contents of peer reviews.

Industrial internships are assessed by a supervisor in the company and approved by a supervisor at EPFL. The Master thesis tests the overall skills of students reaching the end of their training in engineering and architecture. An external expert participates in this evaluation.

All student performances are recorded by the Registrar's Office through the IS-Academia software.

F 3.1.6. Quality of Resources and Infrastructures

Several actions are conducted to evaluate and make available the resources expected to properly supervise students and provide adequate structure to our teaching:

The VPE, the DAF with the VPRHO keep on prospectively analyzing the impact of the measures already taken, and those prepare, in order to adapt our campus to the increased number of students learning on campus. These elements are derived from a specific monitoring and analysis conducted by the DAF ("Domaine de la formation") regarding classroom needs. This analysis plans with a steady state estimate of the resources required for the management of 10,000 Bachelor and Master students. This permanent monitoring is also key to obtain a projection of the number of professors, PhD students and tutors required and release the installments - in time - of a dozen people who are mainly devoted to teaching courses for first-year students.

Actions already taken:

- A renovation program of the auditoriums and existing classrooms has enable a densification of work places and has brought about 1,100 additional seats in 40 classrooms and 17 auditoriums.
 - The Polydôme building has been converted into a 180-seat auditorium.
 - EPFL has requested has now converted the former chemistry library into an auditorium with 250 seats.
- New buildings (DLL and Artlab buildings) have also significantly increased the number a studying place for our students. They Include space for practical work designed to allow experimental design included in engineering study plans.
- Moreover, a project has now been signed and started in collaboration with the University of Lausanne for the construction of a new building dedicated to practices in chemistry and molecular science (Wet lab). The building will be operational in 2020.

Other actions are underway:

- Given the increase in intermediary examinations and tests, performed completely or partly in the form of multiple-choice questions, the education domain has created a new position to help in the design and analysis of these events.
- A dozen or so EPFL online courses ([MOOCs](#)) are newly created each year and are now used for “flipped class” teaching. Used in this way, these online courses are considered today, as tools not only to complement lectures, but also to adopt a more participative pedagogical approach need for the student-centered teaching and learning that EPFL wants to promote. The school disposes to this end of infrastructures and an editorial committee for the management and creation of these courses, with a financial support to professors who propose them.

F.3.2 RESEARCH

F 3.2.1. Quality Assurance Processes

Assessing the quality of research performed at any university only through rankings can be quite superficial. As said by our President Martin Vetterli: “if indicators become the goal, then they lose all credibility and value”! However if we are doing well, a kind of effect of the quality of our work should be reflected in them.

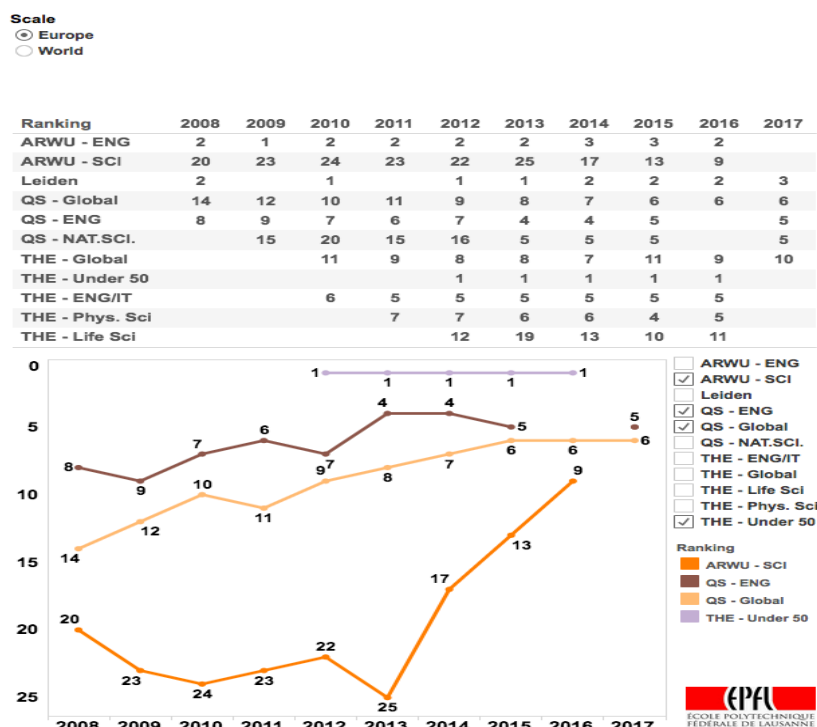
The evaluation of the quality in research remains a challenging task. Indeed, merely simple “beans counting” of publications in high visibility scientific journals does not prove the quality of the research that is carried out in an institution. EPFL plans to create therefore a think tank that aims to generate other ways to evaluate the quality of research based more on its impact on scientific and technological knowledge, reproducibility, openness, and positive return for society.

To this end, EPFL is fully adopting the values defended in [Responsible Research and Innovation \(RRI\)](#) of horizon 2020. It should become a entire part of its approach to do research and guide the principles used for its quality assessment. This involves ethical principles and, if possible, such considerations should also allow us to become more aware of and anticipate the potential implications and societal expectations of the research and innovations developed in our institution.

Quality of research is of paramount importance in a research-intensive university as EPFL; furthermore, it translates directly into the quality of education. EPFL Quality assurance of research is performed both internally and externally; the model published by [the British Research Information Network](#) inspires it.

The EPFL external quality assurance operates at different levels:

- a) **For EPFL articles in peer reviewed journals:** by the assessment of the editorial committee, which accepts, declines or preconizes content modification before publication. EPFL researchers publish mostly in the best peer-reviewed publications.
- b) **For research projects:** international, European, national funding agencies (such as [Innosuisse](#) and [FNRS](#)) select research projects, on a competitive basis, fund them and eventually evaluate their output. The high level of EPFL research projects funded by external agencies (for instance, the high number of [ERC grants](#), points at the excellent international performance of the institution.
- c) **For EPFL as a whole,** [international rankings](#), which provide a kind of “global picture” of the overall EPFL performance, are used essentially as a benchmark orientation:



The key process to aim at a given level of excellence will always remain directly linked to the quality of hiring full, associated and assistant professors.

For this process, there is a strong interaction at all levels between the different EPFL stakeholders. In particular, the EPFL Senior Management and the School Deans assess not only the quality of the candidates' research, but also respect a wide range of different competences and skills of EPFL faculty members. This assessment is particularly carefully carried out at the level of the tenure process where two complete evaluations are performed independently: one at the level of the School, and one at the level of EPFL, before submitting the proposal to the ETH-Board. The promotion file is very complete and includes, not only the list of publications, and citations of the candidate, but also written evaluations by eminent and respected expert-colleagues, both at a national and international level. The file also contains, for example, the 5 most important publications, as well as research and teaching plans. Furthermore, in a last step, the appointment of a professor is reviewed and validated by the ETH-Board. The tenure process has been discussed recently in great detail at all levels of the school, by involving all stakeholders: it has for instance been largely improved by a thorough work done by a group of concerned assistant professors.

Quality Assurance of the EPFL research is fully supported by the services of the EPFL [research office](#); EPFL School and College evaluation processes also contribute in a major way to it.

F 3.2.2. Periodic Evaluation of Research Results

Each year, the Research Office in the central service at EPFL provides a still confidential document, presently addressed exclusively to EPFL Senior Management. The aim is to globally summarize the different possible indicators for the quality of research. This document contains a wide range of tables, in particular numbers concerning publications (citations, highly cited papers, journals in which EPFL researchers publish, etc.) and also, numbers about external funding. It is certainly not the aim of this document to compare individual researchers, or even the different schools with one another. Rather, its objective is to obtain an accurate picture of the evolution of the research quality at EPFL.

The evolution of, over the years, more than the different numbers themselves, provides a rather fair approach to assess the changes in quality of a given research field, and, if necessary, to push to react, in case of necessary strategic re-orientations or corrections, with the transparent "who, why, how, and when" appropriate questionings.

School and College evaluations, on a 6-year basis (see F 1.2), are also part of the periodic

evaluation of research. An audit committee appointed by the ETH Board also regularly evaluates the overall performance of the ETH domain.

F 3.2.3 EPFL Doctoral Programs and Quality Assurance

The EPFL doctoral programs, which currently count 2058 doctoral students, exist since 2003. During the last 14 years, the number of students has doubled. However, the increase has slowed down during the last couple of years. Structures and regulations are now well in place, and at the moment the focus is on building a strong community feeling within the disciplines, while at the same time opening possibilities for interdisciplinary research. The former is especially important since the number of EPFL off-site campus is increasing, allowing for close collaboration with local SME's, but leading to additional challenges related to exchanges between students at different locations, study plan requirements, and teaching tasks (courses and teaching generally take place on the EPFL's main campus).

Organizational Structure

The [doctoral school](#) consists of [20 doctoral programs](#), which are each managed by a program committee presided by a program director. The program committee has up to 12 members who, except for the student representative, are mostly professors or senior scientists. The Vice-President for Education (VPE) appoints the committee members and program director at the proposal of the laboratories or Chairs in the program. The VPE, heads the doctoral school. The doctoral programs are not necessarily linked to only one EPFL School. Several programs are truly interdisciplinary, and have students and professors from different Schools who are involved in interdisciplinary research projects.

Legal framework

The Federal Ordinance and EPFL Directive govern the doctoral studies in all doctoral programs. However, to allow flexibility, each doctoral program has individual program regulations. Here details are provided on the program's study plan, the candidacy exam at the end of the first year, annual reports, mentoring, and other issues ([The EPFL ordinance and Directive](#)).

Study Plan

PhD students need to follow courses which - depending on the doctoral program to which the students belongs - represent between 12 and 30 ECTS ([list of available doctoral courses](#)). Out of these, at least 4 ECTS need to be obtained during the first year. In addition to this scientific and technical knowledge, transferable skills are very important. A broad range of courses for transferable skills is available for EPFL students. Transferable skills are also acquired due to the teaching obligations for doctoral students. These obligations, which will be integrated as mandatory to obtain the PhD title, should amount to the equivalent of 25 ECTS (i.e. 25 x 28 hours) of their thesis time. The teaching tasks are varied, but generally consist in assisting a professor with his course (helping students with exercises, small experiments, full supervision of students projects, etc.) but can also involve, for example, assisting with the preparation of a MOOCs.

Quality Assurance of the Doctoral Program

The quality of the EPFL doctorate is verified at different levels and points in time. The first step is the hiring process. This is followed by a candidacy exam after one year, annual evaluations, and finally an oral thesis exam and public defense after 4 years. To develop the strategy of the doctoral program - with the aim of maintaining and, where needed, improving it - surveys are conducted regularly.

Recruitment

A fair and competitive recruitment process, in combination with the candidacy exam after the first year, ensures the excellence of the doctoral students. Generally, candidates should apply to the doctoral program of their choice, by its fixed deadlines. However, programs sometimes also publish specific offers. A first selection phase consists of the evaluation of the application file. Admission being extremely competitive, it is crucial to prepare it very carefully. The application is directly submitted to the chosen doctoral program. A committee evaluates and takes a decision on the application, taking into account the research interests and potential thesis directors indicated. If the applicant is admitted, he/she will have up to one year to enroll. If an EPFL lab hires him/her, his/her contract will be organized during this time. Some time will also be needed to sort out any visa and residence permit requirements. The application file is entirely completed online, via the

online application form.

To a fair extent, the recruitment takes now place in the form of hiring days. Here, all the candidates, whose application files are selected, come to EPFL and meet several potential thesis supervisors. All students are therefore evaluated together with their peers by different professors. The hiring days furthermore enhance a program's community spirit and improve the students' integration. Details on the EPFL recruitment process, aimed at prospective students, can be found from the website of the [doctoral program](#).

Candidacy Exam

At the end of the first year, the student is submitted to a candidacy exam. The main aim of this exam is to ensure that in addition to the ability to perform academic studies, the student is able to work in a laboratory in collaboration with a team of researchers and technicians. During the exam, the students present and defend a research plan, as well as obtained results/on-going studies, in front of an academic committee. The candidate should fulfill several requirements to be formally accepted to the program after this first year, namely; succeed the candidacy exam, have the agreement of a thesis advisor to supervise the thesis work, have a research plan that is approved by the thesis advisor, and have obtained the required ECTS credits for the first year.

Oral Thesis Exam and Public Thesis Defense

In addition to the normal supervision of the Ph.D. student by his advisor, the doctoral candidate has to submit annual reports on the progress to their thesis advisor, who in turn provides written feedback. Three years after the candidacy exam, the thesis should be ready. The student should present and defend their thesis at the oral thesis exam in front of the thesis jury. The jury consists of the director of the doctoral program, presiding the jury, the thesis advisor, one EPFL expert and two external experts. Some weeks after the jury has accepted the thesis, the student has a public thesis defense where the thesis is presented to a larger audience. An overview of the different stages of the doctoral studies is displayed in Figure 4.3-1.

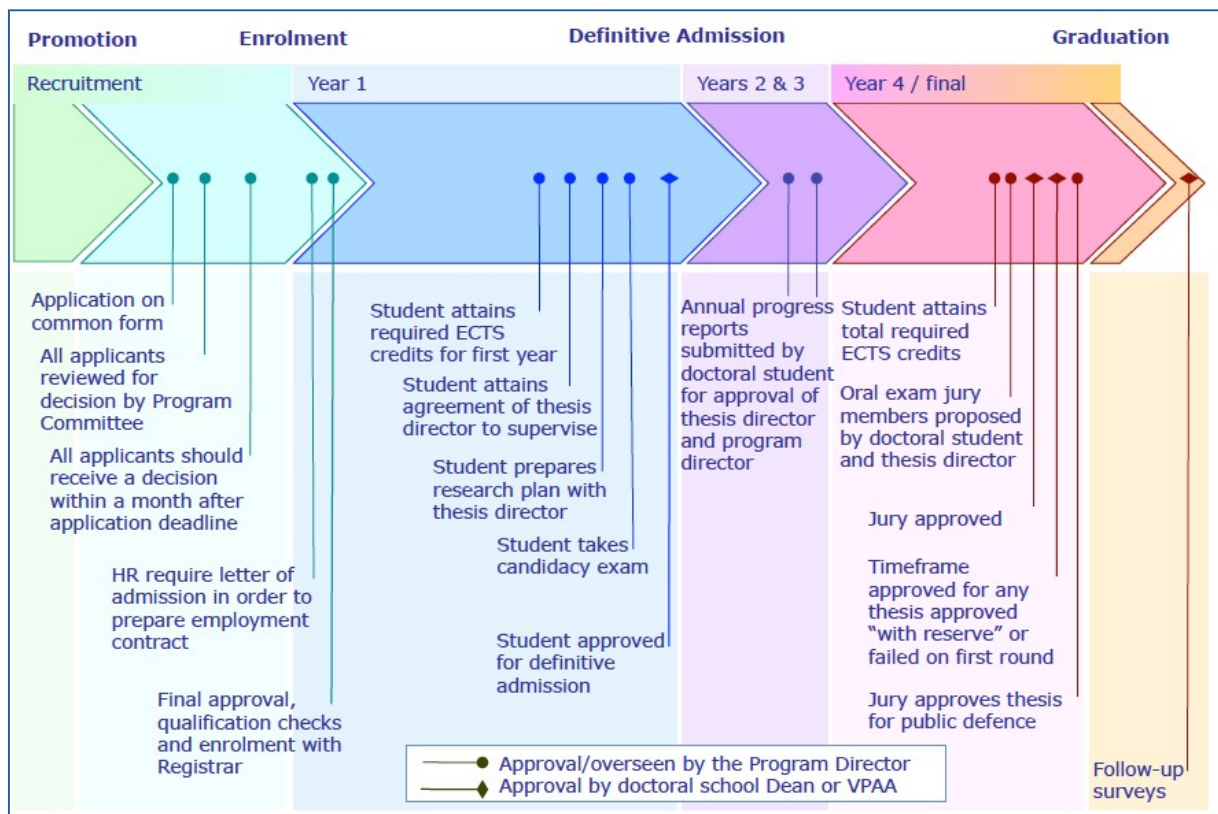


Figure F4.3-1. Main Process and time schedule of the EPFL doctoral studies

Periodic and End-of-Thesis Surveys

In addition to annual/biannual analyses of the end-of-thesis questionnaires, two large surveys - aimed at all doctoral students of EPFL (Doctoral Surveys I and II, cf. F 1-3) - have been conducted in

2003 and 2012. The response rate for these surveys was large; the 2012 survey had 1'217 respondents. In addition to these periodic surveys, there is an end-of-thesis survey, which is completed by all students just after finishing their thesis, thus involving about 350 students per year.

These surveys provide very detailed information on different aspects of the EPFL doctorate. The questions concern the global satisfaction, choosing and arriving at EPFL, training, workload, supervision, and career possibilities. This information enabled EPFL to improve the doctoral studies where needed. The analysis of the 2012 survey results is available [here](#). The current strategy of the doctoral school - which is based on the outcome of the 2012 survey results and the end-of-thesis surveys.

F 3.2.4. Qualification of EPFL Employees in Research (and Teaching)

EPFL has the following mechanisms at its disposal:

- a) All employees, whether scientific or not, as well as all faculty members are appointed on the basis of a specification in a competitive mode: the position is advertised and communicated in the media and on the school's [website](#).
- b) All EPFL employees have an annual qualification review in which their performance and competences, but also any needs of [training](#) to improve or gain skills are discussed. This is also an opportunity to propose training related to these needs.
- c) All EPFL employees have the opportunity to enroll in continuing education seminars offered by the school, in connection with acquiring generic skills, also at the [language center](#).
- d) Scientists and faculty members participate in seminars, colloquiums, conferences, symposia, or make short stays in foreign laboratories to update their knowledge and skills in their areas of research. Faculty and staff also have the opportunity to go on sabbaticals. For doctoral students, see subchapter (F 4.3).
- e) The promotion of scientific staff is fixed in the [directive](#) on academic titles granted to scientists at EPFL. Any promotion of an EPFL employee, including that of tenure-track assistant professors, takes into account an educational file including the list of given courses and their evaluation by students: the file is accompanied by a letter from the Section Director giving his opinion on the candidate's contribution to the education. The modes of assessment promotion and promotion of tenure-track assistant professors, are included in the [Regulations concerning tenure-track assistant professors](#); those of associate professors are included in the [Regulations of appointing associate professor to full professor](#).
- f) The faculty can benefit from the support such as pedagogical courses and seminars organized by CAPE, but also of a CAPE local service, of a CAPE personalized assistance on request, especially in case of a subcritical assessment of teaching. Ad-hoc courses are also organized for [doctoral students and post-docs](#); a training day is set up for students participating in [coaching](#).

F.4. INTERNAL QUALITY MANAGEMENT

EPFL's quality assurance management follows a waterfall system, from the highest levels of the federal government - at SEFRI, to single employees at the school, which provides it with a strong consistency. The figure below provides a "cockpit view" of the EPFL Quality Management System (QMS). Quality audit and program accreditations are considered as full parts of the EPFL MS.

Organ/ Person	Content/ Level	Reference document	Type of evaluation	Frequency
SEFRI/ Federal Council	S T R A T E G I C	Message FRI 2017-2020	Final eval.	Once every 4 years
CEPF		Strategic Objectives 2017-2020	Intermediate and final eval. SEFRI reporting	Once every 2 years Once a year
EPFL		EPFL convention of objectives 2017-2020	DIALOG and CEPF Reporting	Once a year
Schools and Colleges		Institutional Accreditation (LEHE) Before 2022 (AAQ)	Satisfaction surveys	Once every 4- 6 years
		Program Accreditation (Cti, 2021)		
		Selfassessment doc. for audit	School/College eval.	Once every 4 -6 years
		EPFL convention of objectives	Assesment with EPFL Senior Management	Once a year
Institute		Autoeval. Doc. for audits	School and College Eval.	4-6 years
		Strat. doc. of Schools and Colleges	Institute Eval.. Discussion with the Dean	as the need may occur Minimum once a year
Sections		O P E R A T I O N A L	Programme content; tools of continuous improvement; competences Grid ; education comm. ; academic comm.; advisory committee (pv)	Self assesment by the Programme Director
Teaching staff	Syllabus Teaching Content		Student evaluations	Once per semester
Managers, Collaborators	Personal specifications, List of annual goals		discussion and personal assesment	Once a year

EPFL's quality management system especially covers the following key activities and major tasks of EPFL.

Figure 1 4-I Cockpit view of EPFL's quality assurance management

F.4.1. Content and Communication of the QMS

EPFL QMS contents, processes and procedures is incorporating, by definition, the part concerning the processes that are common to the ETH domain. The related information is accessible to all and are clearly stated on [EPFL's website](#), with many references. They are segmented into two parts:

- [Content on the QMS](#) was established within the scope of the common standard advocated by the two agencies OAQ/Cti, included in the self-assessment documents and audit reports since 2006. Audit results and remedial measures are presented to EPFL's management and the ETH Board during DIALOG sessions. The Secretary General at the EPFL Presidency carries out the monitoring of the latter. The details of the EPFL QMS are exposed in chapters A and F of this self-assessment document.
- Information dealing with internal quality assurance of the ETH domain, mainly the evaluation of [Schools and colleges](#) (with external peer review mode). Key processes and procedures for School and College assessment can be found in four documents listed with other relevant texts on this web page:
 - EPFL Guideline from 2012: [Evaluations in the ETH Domain](#);-
 - Evaluation procedure and process: [Evaluation of EPFL Schools and Colleges: Quality Procedure](#)

The preparation steps for the assessments of Schools or Colleges (dealing mainly with their vision, strategy, management, faculty recruitment, research, doctoral programs) are subject to preparation and follow-up meetings with the respective Deans or Directors and the quality manager, particularly to determine the list of experts and the *terms of references*, both approved by the Presidency; *i.e.* the audit is prepared by the steering committee of a school and all stakeholders of the latter participate in the drafting of the self-assessment report. The audit report is presented both the School direction at the EPFL management, and then, in a second step, the Dean informs the management on the position of the School, as well as proposes remedial measures to be implemented.

All the aforementioned will be not only presented during the DIALOG sessions (an annual meeting between a delegation of the ETH-Board and the EPFL Senior Management, which reviews the implementation of EPFL strategy and projects), but also discussed in a meeting of the ETH Board. The Dean communicates also the audit results to the collaborators of the School. Two to three years after the audit, the Dean delivers a midterm review to the EPFL management. A last review of the implementations of the remedial measures is delivered to the expert team of the next School evaluation.

F. 4.2. Stakeholder Involvement

The involvement of stakeholders has already been mentioned in item A, including that of students in programs management. Other information can also be found in the portion of the report devoted to sections. We conduct periodic satisfaction surveys (approximately every six years) of internal stakeholders performed globally at EPFL (one will be conducted in 2018):

- ***The Campus II 2012 Survey*** of bachelor and master students at EPFL. The results are globally very positive and show a significant improvement in student satisfaction; indeed, the respondents appreciate the quality of the delivered education and also to be part of EPFL. The ratio of unsatisfied respondents is below 3% in all sections. Their satisfaction is significantly higher than in 2004: despite some weak points detected and described in the management summary of the survey, the education is globally very well perceived at EPFL. The remedial measures and a first follow-up are included in documents available on request.

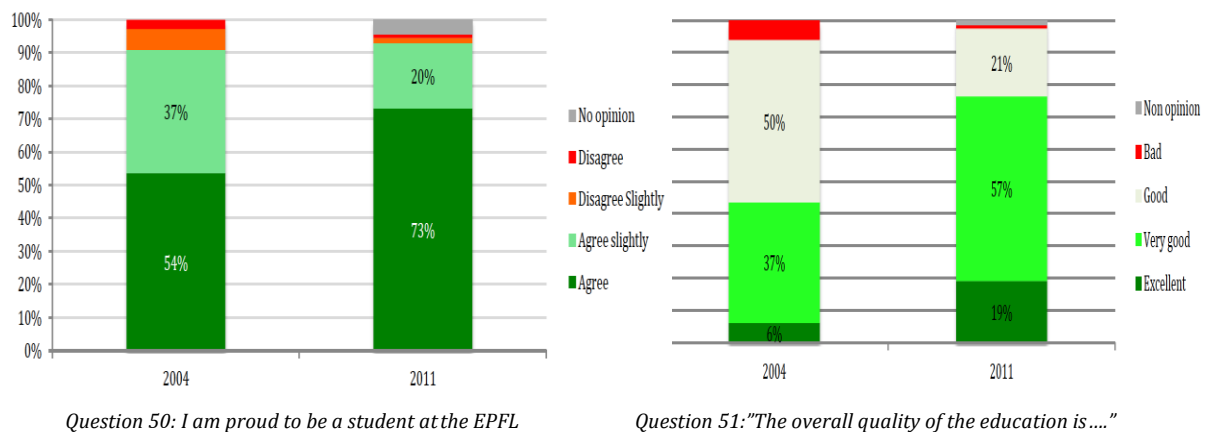


Fig. F1.3-1 Overall Satisfaction Progression of Students 2011 versus 2004

- ***The Doctoral II 2012 Survey*** of the PhD students at EPFL. Again, the results are globally positive: overall, the 2012 survey reveals an encouraging level of satisfaction of the doctoral students, while still showing significant room for improvement for instance in supervision, variety of doctoral courses and recruitment procedures. 85% of Ph.D. students are satisfied with the conditions under which they are conducting their thesis research (as compared to 90% in 2005, a comparable result). 90% identified that the advice from their thesis advisor was useful or very useful. The remedial measures following the investigation and a first follow-up are available on request.
- ***The ATMOS II Survey*** addressed EPFL employees (excluding PhD students). The survey covered 10 topics. Overall, just as the identification with the institution and its strategies can be classified as strong, the involvement and satisfaction of the employees and coworkers, especially professors, were very good. The average increase of +0.5 points compared to the index of the first survey in 2004 (Atmos I; 4.0 out of 6) is noteworthy with improvements in

almost all areas. This positive result, however, should not draw attention from more unfavorable results, where improvements are desired. The results of ATMOS II have been compared with those of a similar survey conducted by our sister institution, ETH Zürich. Very similar patterns of satisfaction were found for the 10 topics (including evolution of professional activity, career and mobility).

Regarding the process aspects, all questionnaires, investigation reports, and remedial measures were validated by the EPFL management, and presented to the CEPF during the DIALOG session. For Campus II, the monitoring of remedial measures is performed by the Dean of the bachelor and master programs, for Doctoral II by the Dean of the PhD program (would be now the VPE), and for ATMOS II by an ad-hoc committee composed of the Secretary-General, two Deputy Secretaries General, the HR manager of EPFL and the Quality Officer of EPFL.

Investigations and management decisions concerning remedial measures have been the subject of an internal communication, particularly at CDS, at a meeting with Deans, at the committee of doctoral program directors, at the school's Education Assembly, at the School Assembly, and also in internal meetings of the VPAA. The VPAA Newsletter, Flash, also published articles about them.

The comprehensive surveys above, placed directly under the supervision of and coordinated by the EPFL's Quality Unit are not by far the only ones to be conducted within the institution. Other EPFL units also conduct surveys independently and regularly, for example:

- the [Career Center](#) for the insertion of new alumni (see chapter E);
- the [Educational Affairs](#) for the annual satisfaction survey regarding service to students, which enables to adjust and improve the services;
- the AGEPOLY - here as part of a survey in 2013 on new teaching methods and EPFL's education reform, in order to convey the concerns of the students to management;

Other satisfaction surveys by certain services that will fall now within the new VPRHO are also conducted periodically on EPFL collaborators such as [EPFL's travel agent](#) and the unit in charge of coordination of [catering](#)

F.5. EXTERNAL QUALITY ASSURANCE

F.5.1. Quality Audits and Programs Accreditation by OAQ and Cti

Although EPFL maintains relations with Cti since 1992, and with OAQ (now AAQ) since 2003, it wasn't until late 2006 that a joint audit (the first) of the Swiss and French agencies was conducted on the basis of a common quality standard. This audit resulted in 2007 in the Cti accreditation for 13 master degrees in professional engineering (Cti notice 07/06-13 regarding the approval by the state of engineering degrees awarded by EPFL) as well as an accreditation by the OAQ of the school's bachelor and master programs.

Since the Cti notice granted accreditation for three years for the two degrees in Life Sciences and Technology and in Bioengineering, a reduced audit, also combining the two agencies, was held in the spring of 2010: the self-assessment document prepared for this purpose also included the follow-up of remedial actions recommended by both agencies, and a folder for the authorization of a new master degree in Technology Management, but also the request to extend the accreditation for the EPFL engineering degrees until 2016.

Upon completion of the 2010 audit, the extension of the accreditations for the two new degrees was granted, approval was given by the two agencies regarding EPFL's implementation of remedial actions, the master degree in technology management received an accreditation for a period of 3 years, and EPFL's 13 master degrees received the label Eur-Ace; the accreditation period for other engineering degrees was extended until 2016 (Cti notice of 2010/05-10 for the engineering education of EPF Lausanne).

In 2013, a self-assessment report concerning a two-year extension of the accreditation of the master degree in Management of Technology from January 2014 was sent; it was approved (decision of the Cti from November 13, 2013 and from the French Ministry of Higher Education and Research of January 23, 2014).

In 2014 EPFL was subject to a joined quality audit organized by the Swiss agency OAQ and Cti, on the basis of a common standard accepted by all parties in December 2013.

Upon completion of the 2014 audit, the Cti issued a favorable opinion for the renewal, for the maximum period of 6 years i.e. from 1 September 2015, of the admission by the State of 14 master's degrees of the Swiss Federal Institute of Technology in Lausanne.

In addition, the Cti issued a favorable opinion on the opening, for a limited period of three years from 1 September 2015, of the admission by the State of 3 master's degrees from the Swiss Federal Institute of Technology in Lausanne in the following specialties and professional designations:

- **Gestion de l'énergie et durabilité**
(Ingénieur en gestion de l'énergie et durabilité)
- **Ingénierie financière**
(Ingénieur en sciences financières)
- **Science et ingénierie computationnelles**
(Ingénieur en sciences computationnelles)

Those 3 programs are the object of the current demand of EPFL to the Cti for is venue the 20th to the 21st of March 2018 in view of the extension of their accreditation.

Reference or URL of this chapter

1. <http://direction.epfl.ch/en/presentation>

F. 5.2. Special accreditation of other educational programs:

- EPFL's Bachelor/Master program in architecture complies with Directive 85/384/EEC since 2009;
- The Executive MBA in Technology Management (EPFL's continuous training) has the [AMBA accreditation](#) since 2013;

G. 5.3. Other Accreditations/Certifications

Quality systems are being used in laboratories and EPFL units, such as for example:

- Under ENAC: the *Traffic Facilities Laboratory* (ENAC School) is accredited under ISO 17025 for four test areas: bituminous binders, aggregates, asphalt concrete, "in situ" tests.
- Within the SV School:
 - Animal labs have a SPF certification.
 - A [safety management system](#) is in place.
 - Moreover, ISO certification has been attributed in 2016 to its central core facilities for central services (glassware washing facilities, preparation of solutions, P2 Lab Waste disposal);
- The [real estate and infrastructure sector](#) integrated in the central services and VPRHO has an ISO 9001 certification.
- The EPFL Forum organization has an [ISO 14001 certification](#).
- The [BALELEC festival](#), organized by students is already ISO 14001-certified, has recently got its ISO 20121 certification.

H. 5.4. External Financial Supervision of EPFL - [Controlling](#)

In addition to the work carried out by EPFL's own financial controlling unit, these external bodies do supervision and controlling:

- The Federal Audit Office (CdF).
- CEPF's Internal Audit Office (AI CEPF).
- The auditors of the European Commission (EC) and those of the European Court of Auditors who review research projects funded by the European Community.

Their activities are not restricted to merely financial control but also include process control.

IMPRESSUM:

By Prof. William-F. Pralong, EPFL Quality Delegate to the Presidency, office of the Secretary General.

The present self-assessment report is an adapted version of the 2014 report, done the closest as possible to the CTI international References- Guidelines approved by CTI's plenary assembly the 14th of November 2017. However, the strategy followed for its redaction is similar to that previously used for the joined visite done by CTI/OAQ in 2014, and written with Dr Michel Jaccard, former EPFL Quality Officer EPFL, has been conserved. The intended learning outcomes for the programs are still those taken from the previous references and guidelines of CTI.

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