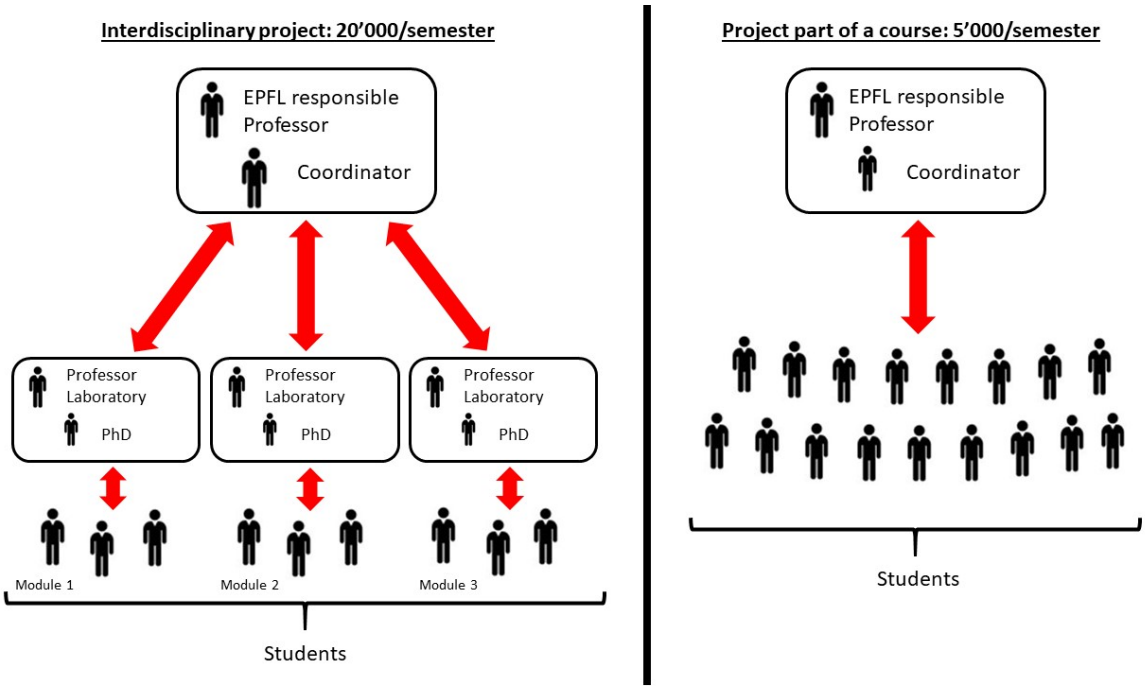
Conditions and procedures for a project to be eligible as an EPFL MAKE project

Nature of the projects

Two main families of projects have been identified, projects that are **part of a course** integrated into the curriculum and **interdisciplinary projects** involving students who are credited under different modules and are coordinated by a third party. Because of the different framing implications, it is proposed to differentiate the supports available for these two families of projects.

Project included in the study plan
Type of projects supported in the past (Robotic Competition, Horological Competition, China Hardware Innovation Camp (CHIC), Lab in a Tube, iGEM, SENSUS). The students involved in these projects come from different backgrounds but are supervised by a Lead Professor in a specific credited course.
Order of magnitude of the support: **5'000 CHF per semester**

Interdisciplinary project
Type of projects supported in the past (Hydrocontest, EPFLoop, EPFL Racing Team, Swiss Solar Boat, EPFL Rocket Team, EPFL Xplore, Genorobotics). This format groups together multiple student projects covering the different thematic required to realize the project. Students are supervised by the different Professors involved (monitoring, coaching and grading). The coordinator plays a key role in this format since he ensures the coherence of the different topics and the integration of the deliverables of sub-projects into the central project.
Order of magnitude of the support: **20'000 CHF per semester**



Evaluation Criteria

The projects will be evaluated on their feasibility (operational needs) and their pedagogical contributions.

Operational needs

- A professor in charge of the project must carry the project. He must ensure the technical and scientific interest of the project and the solutions chosen. In addition, an operational manager (who can be the professor himself or a scientific collaborator strongly involved) must play the role of leader of the project and coordinate the student activities.
- Sustainability: The setting up of a sustainable structure is only justified if the project develops over several years, whether it is in the form of a multi-year project or the same project renewed over several years.
- Potential for support: A faculty or section provides support and provides the infrastructure, staff and finances necessary for the project. If support from Discovery Learning Labs (DLLs) is required, prior agreement from the leaders on the availability of infrastructure to support the project is necessary.
- Funding: Projects must include information on how they will be funded.

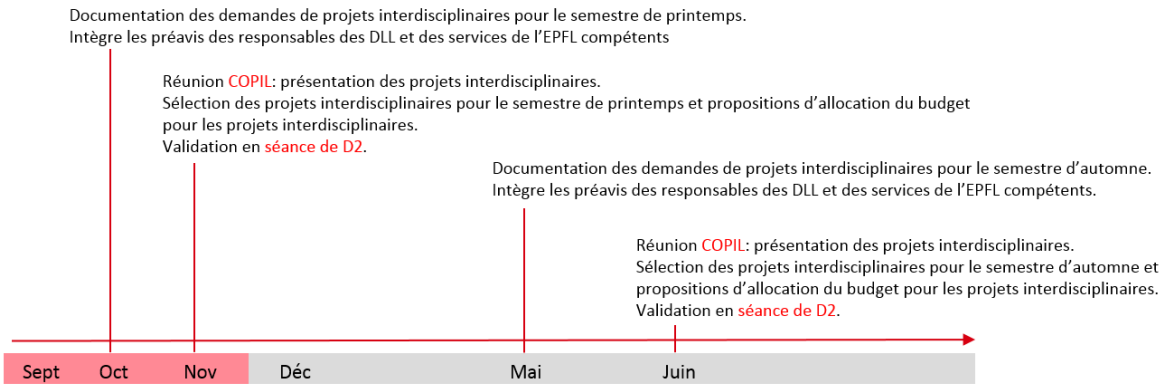
Pedagogical objectives

- Learning by doing: Putting the participants' specific expertise into practice in concrete projects. The projects should reinforce theoretical learning seen **in courses** through practical implementation.
- Open ended: Projects offering the possibility for students to develop their creativity and a project approach by looking for solutions to an open ended approach ("open ended approach" versus "push button" or "follow the recipy").
- Interdisciplinarity: Favouring interdisciplinarity by allowing students from different backgrounds to contribute to the project with their respective backgrounds. The prototype(s) to be produced must be complex enough to lead students to make compromises.
- Professional skills: Develop transversal expertise (group management, project management, etc.).
- Sustainability: The project must, as far as possible, lead students to consider the dimension of sustainability in their project. The aim is to evaluate the system(s) as a whole and to implement sustainable solutions consistent with this system

Validation process

The academic validation of the projects will be given by the MAKE committee (COPIL) on the basis of a project description (written submission form and video presentation of the project) and a favorable notice from the DLL managers and other EPFL bodies that will be affected by the project activities. The project is described in writing and is presented to the steering committee by the coordinator and a student representative of the project.

The formal registration of the project is done through the operational manager(s) with the students. The presentation schedule is as follows.



An evaluation grid is made available to MAKE committee members to help them in their evaluation.

Project evaluation procedure

One month before the MAKE committee meeting
The submissions received, together with the project presentation video, are forwarded to the MAKE committee members by the coordinator of interdisciplinary projects after the submission deadline.

Two weeks before the MAKE committee meeting
The coordinator of the interdisciplinary projects sends a summary of the projects with a notice taking into account the coaches' prior notification as well as a scoring framework for the projects taking into account the criteria of the evaluation grid.

During the MAKE committee

The agenda is as follows:

1) Introduction and reminder of the procedure.
2) For each project and sequentially :
    a. Applicants are invited to come and answer questions from the MAKE committee members (10 to 15 minutes maximum).
    b. Rating of the project by the MAKE committee members using the evaluation grid.
3) At the end of the presentations, the MAKE Committee members, who have voting rights, are invited to make an individual ranking of the projects. This ranking is entered individually into the Mentimeter platform.
4) A summary of the rankings is presented to the MAKE committee members giving a final ranking of the different projects. Financial indications are added to indicate on the basis of this ranking the projects that can be supported.
5) Discussion of the results among the members of the MAKE Committee and possible modifications by unanimous vote.

Project Evaluation Grid

This evaluation grid is intended to help MAKE committee members in the project selection phases and proposes sub-headings identical to those in the scoring frameworks. It is not intended to impose a point-by-point rating but to allow an overall evaluation of the projects in relation to the objectives of the MAKE Fund.

Feasibility (Prefilled by interdisciplinary project coordinator)	Pedagogical impact	
EPFL academic responsible and coordinator	Learning by doing	Open ended
Potential project evolution	Interdisciplinarity	Professional skills
EPFL support		
Finance	General prior notification (Prefilled by interdisciplinary project coordinator)	Sustainability
Positive prior notification Positive prior notification under some conditions Negative prior notification		

1. Operational needs (Feasibility)

Under operational needs are grouped the evaluation criteria related to the feasibility of the project. They make it possible to evaluate whether the infrastructures that EPFL can make available are in line with the project's objectives and whether it seems realistic to support the project by ensuring an adequate working environment and optimal security for the students.

The coaches' advance notice allows them to complete the information given by the project teams in order to inform the members of the jury for their decision. The criteria to be noted are :

1.1 EPFL respondents and coordinator

Projects must have :

- A professor who is responsible for the academic aspects and who is in charge of the project.
- A senior operational manager (coordinator) at the EPFL serving as a point of contact and coordinating the project. This role cannot be assumed by a student or a group of students. The operational manager coordinates and organizes the

project on all levels: infrastructure, personnel and financial management, but also security.

1.2 *Potential for evolution of the project*

The implementation of a sustainable structure is only justified if the project develops over several years, whether it is in the form of a multi-year project or a single project renewed over several years.

The project will be evaluated according to the prospects of development and maintenance over several years. An annual review of the project will be carried out to confirm support and to decide if the initial conditions should no longer be met (according to the schedule proposed in the "validation process" chapter).

1.3 Potential for support

It is necessary to make sure beforehand that the supports the project needs (infrastructure, equipment, etc.) are available. In particular, if DLLs (or other prototyping resources such as SKIL or professional workshops) are to be used, a prior discussion with the person in charge is necessary to validate the possibilities.

1.4 Funding

An assessment of criteria 1.1 to 1.4 is proposed to the MAKE committee members by the coordinator of interdisciplinary projects on the basis of the exchanges he had with the applicants during the preparation of the documents and the feedback from the coaches he has consulted.

2. Pedagogical objectives

The project must have a strong pedagogical dimension : it must support the students' learning in their respective fields, allow students to be actors in their learning by giving them the opportunity to propose solutions, offer them the possibility to develop teamwork skills and expose them to interdisciplinarity. The five main points that will be evaluated (2.1 to 2.5) and that will allow differentiating the projects are the following:

2.1 Learning by doing

To put into practice the specific expertise of the participants in concrete projects (learning by doing). The projects should reinforce theoretical learning through practical implementation.

2.1.1 Nature of topics and complexity

The development of the proposed project and the complexity of the elements to be carried out must require the application of knowledge related to the teachings given at EPFL and of a level corresponding to the expected expertise.

2.1.2 Integration into study plans

By integration into the study plans, we mean recognition by the respective sections, the link with courses and the possibility of developing projects that can be credited by professors.

2.2 Open ended

Projects offering the possibility for students to develop their creativity and a project approach by looking for solutions to an open ended approach (in comparison with a "push button" or "follow the recipy" approach).

2.2.1 Development potential

The proposed project must allow sufficient latitude for students to generate their own solutions and take ownership of the work. The nature of the project and its organization must allow for the integration of concept generation, concept selection, prototype development and testing phases allowing students to implement the design and project approach.

2.3 Interdisciplinarity

To promote interdisciplinarity by allowing the integration of students from different backgrounds who contribute with their respective baggage.

2.3.1 Involvement of students from different backgrounds

The project should cover the activities of several sections attached to several faculties of the School. The objective is to allow students from different backgrounds to work as a team on the same project. The evaluation will be made according to the diversity of the laboratories that can be involved in the support of the projects.

2.4 Professional skills

Develop cross-functional expertise (group management, project management, etc.)

Projects must enable the development of transversal skills that complement those taught in traditional courses. The learning of these soft skills is an integral part of the projects and they must be made aware of by the students. It is requested to evaluate the way in which project leaders have planned to integrate the follow-up of the learning of these skills.

2.4.1 Project management

Understands the concepts of complex project planning, task scheduling, timing management, risk management, information structure and documentation.

2.4.2 Budget management

Definition of a budget and follow-up of expenses. Search for additional funding.

2.4.3 Transversal communication

Communication between team members in order to develop a common project. Argumentation and consensus building. Popularization of developments.

Collaboration with the Learn center and the teaching support center (CAPE) is in place to monitor and reinforce these learnings.

2.5 *Sustainability*

The project should enable students to take into consideration a sustainability dimension in the development of their project.

2.5.1 Ecological footprint

As a minimum, the ecological footprint generated by the project must be taken into consideration and minimized by the students (e.g. prototype life cycle, organizational arrangements).

2.5.2 SDGs

If sustainability plays a **central** role in the project's objectives, the committee will take this factor into consideration (see the 17 sustainable development goals defined by the UN: https://sustainabledevelopment.un.org/sdgs),

Also to be taken into consideration

Distribution of projects between sections

The portfolio of proposed projects must allow students from all sections of the school to have the opportunity to participate in such a project. The committee will therefore ensure that support is balanced accordingly.