MASTER
CIVIL ENGINEERING
EPFL

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Dir. Civil Engineering Section

École
polytechnique
fédérale
de Lausanne

Civil engineering impacts our daily life ....

Travel
& transport

Live in
& be supplied

Maintain
& be safe

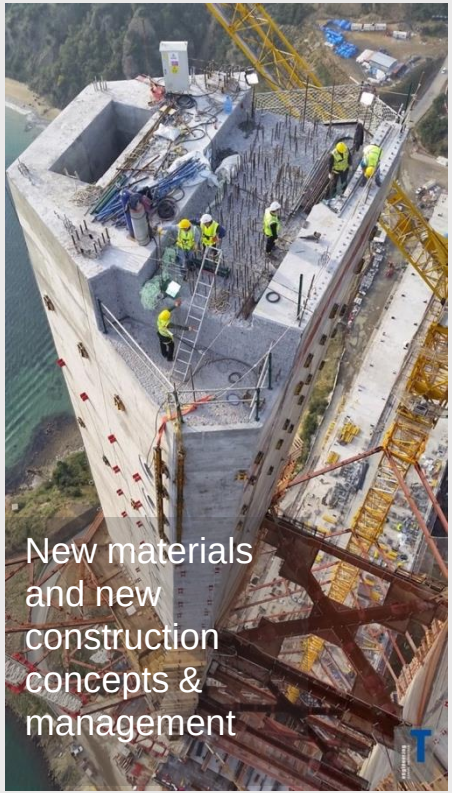
Civil engineering is in direct connection with society and its actors…

At the surface/at height…

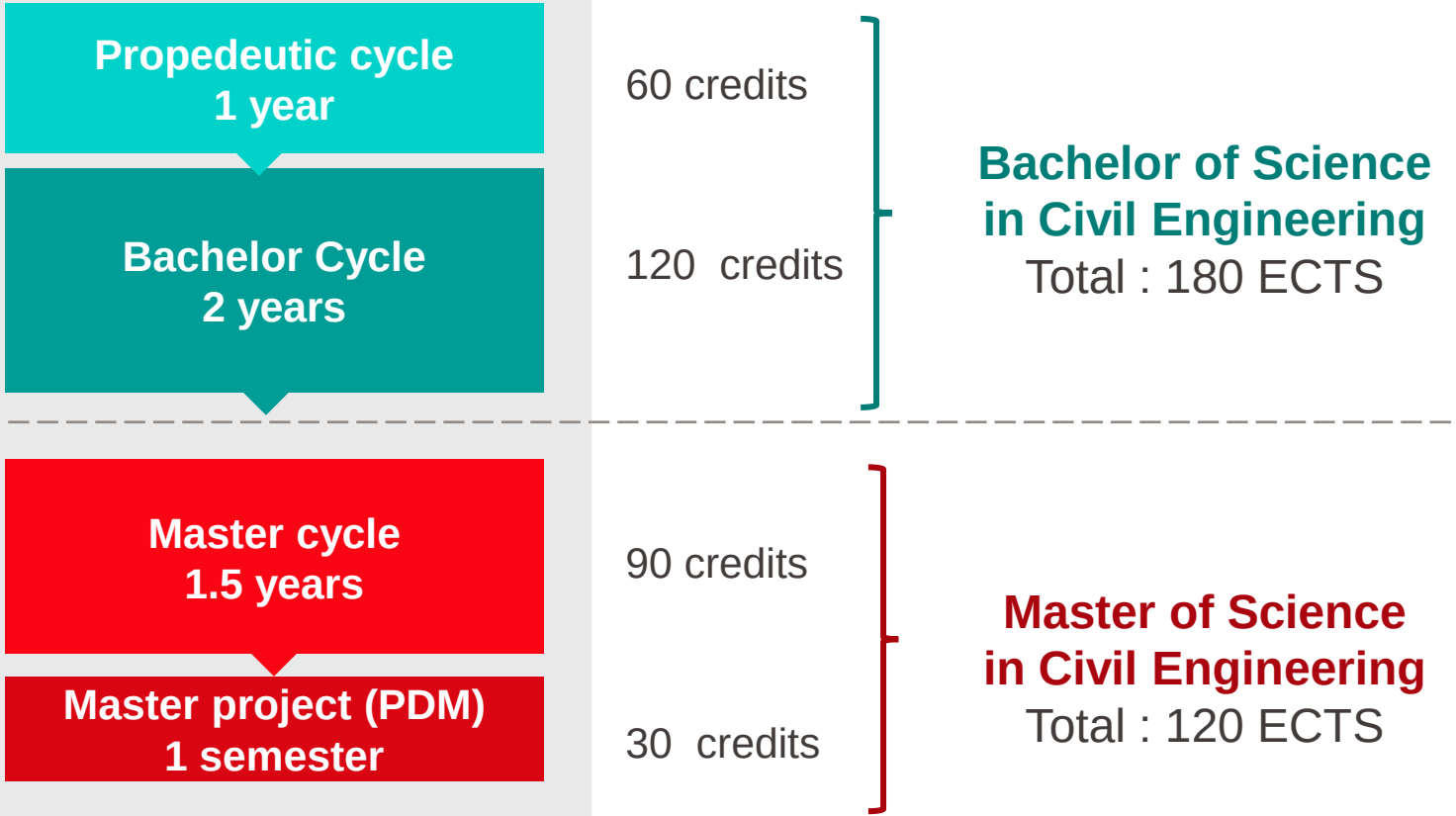
Underground…

Under extreme conditions…

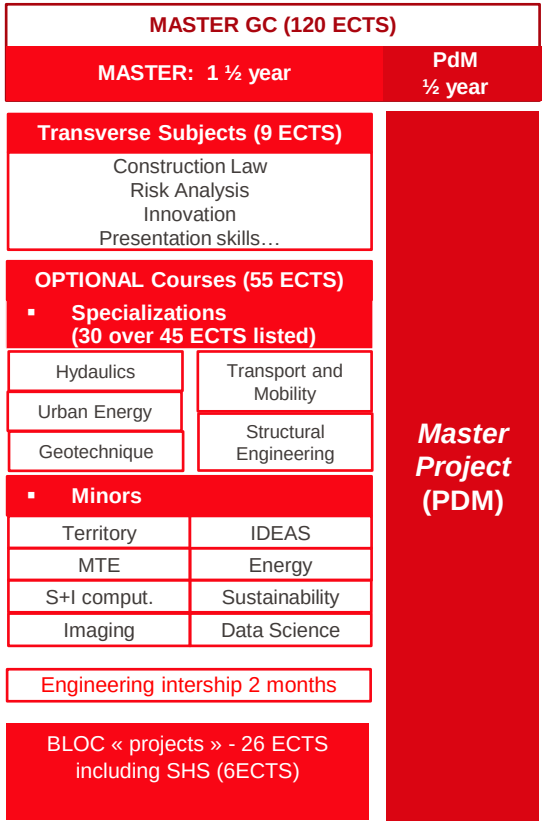
Civil engineering faces the major challenges of our times…



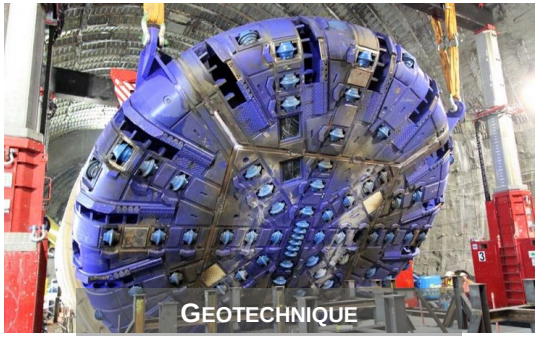
The EPFL curriculum in Civil engineering

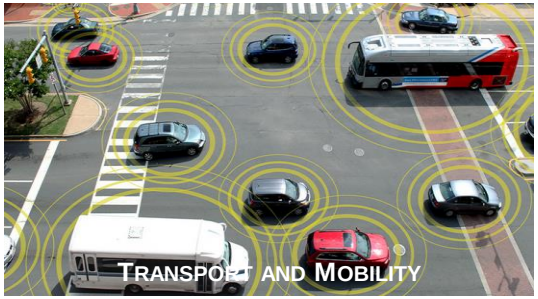


Master curriculum



Five civil engineering specialisations



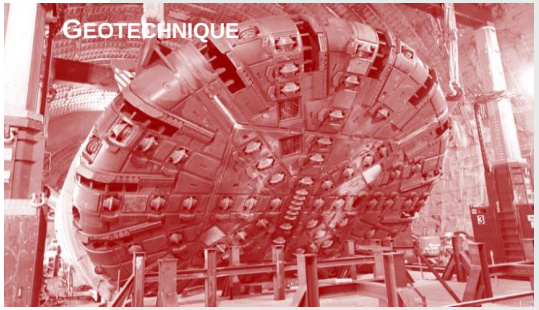


Structural engineering

OUR LABORATORIES IN STRUCTURAL ENGINEERING

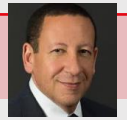
Earthquake Engineering & Structural Dynamics	EESD	Prof. Katrin Beyer	
Resilient Steel Structures Laboratory	RESSLAB	Prof. Dimitrios Lignos	
Computational Solid Mechanics Laboratory	LSMS	Prof. Jean-François Molinari	
Intelligent Maintenance & Operations Systems	IMOS	Prof. Olga Fink	
Concrete Behaviour & Structural Design Laboratory	CONSTRUCT	Prof. David Ruggiero	

Geotechnical engineering

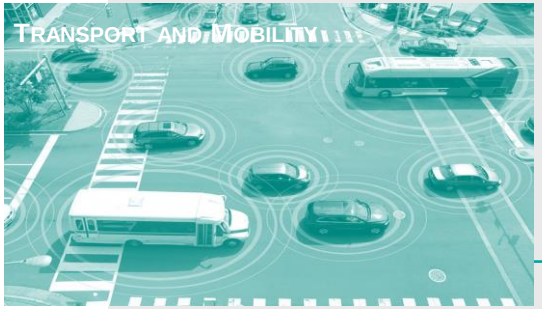


OUR LABORATORIES IN GEOTECHNICAL ENGINEERING

Laboratory of Soil Mechanics	LMS	Prof. Lyesse Laloui
Laboratory of Experimental Rock Mechanics	LEMR	Prof. Marie Violay
Geo-energy Laboratory – Gaznat Chair on Geo-energy	GEL	Prof. Brice Lecampion



Transport & Mobility

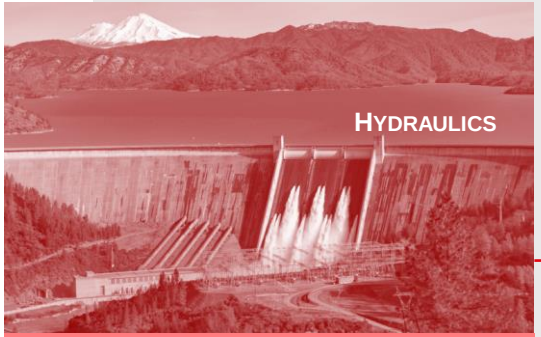


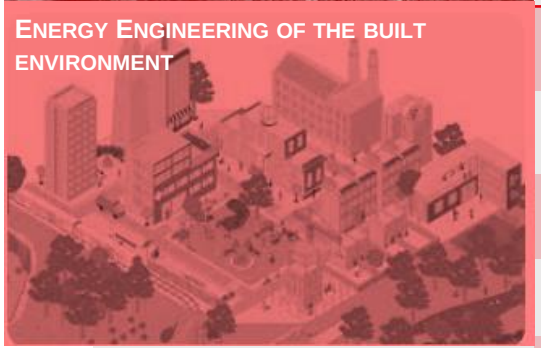
OUR LABORATORIES IN TRANSPORT & MOBILITY

Urban Transport Systems Laboratory	LUTS	Prof. Nikolaos Geroliminis
Transport & Mobility Laboratory	TRANSP-OR	Prof. Michel Bierlaire
Visual Intelligence for transportation	VITA	Prof. Alexandre Alahi
Human Oriented Mobility Eco-System	HOMES	Prof. Kenan Zhang




Hydraulics & Urban Energy





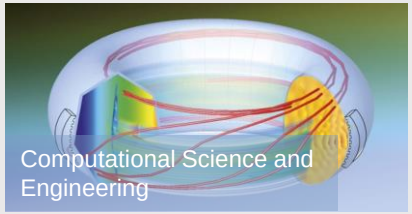
OUR LABORATORIES IN HYDRAULICS AND URBAN ENERGY

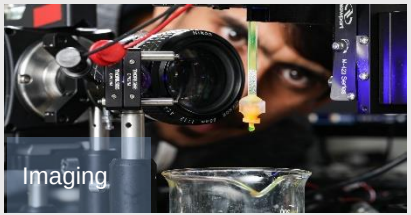
Plateform of Hydraulic Constructions	LCH	Dr Paolo Perona
Environmental hydraulics laboratory	LHE	Prof. Christophe Ancey
The Human-Oriented Built Engironment Lab	HOBEL	Prof. Dusan Licina
Integrated Comfort Engineering	ICE	Prof. Dolaana Khovalyg
Engineering & Technology for Human-Oriented Sustainbaility	ETHOS	Prof. Andrew Sonta





Eight recommended Minors





MASTER GC (120 ECTS)

MASTER: 1 ½ year | **PdM ½ year**

Transverse Subjects (9ECTS)

Construction Law
Risk Analysis
Innovation
Presentation skills…

OPTIONAL Courses (55 ECTS)

- **Specializations (30 over 45 ECTS listed)**

Hydaulics	Transport and Mobility
Urban Energy	Structural Engineering
Geotechnics	

- **Minors**

Territory	IDEAS
MTE	Energy
S+I comput.	Sustainability
Imaging	Data Science

Engineering intership 2 months

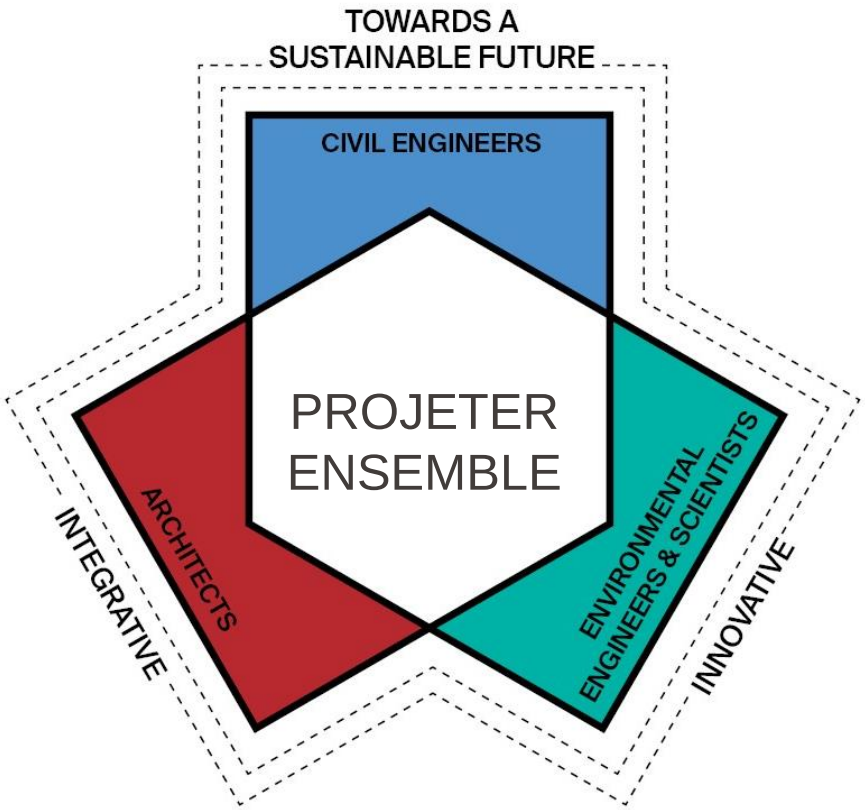
BLOC « projects » - 26 ECTS including SHS (6ECTS)

***Master Project* (PDM)**

90 CDS (9 + 26 + 55)

30 ECTS

Projeter Ensemble

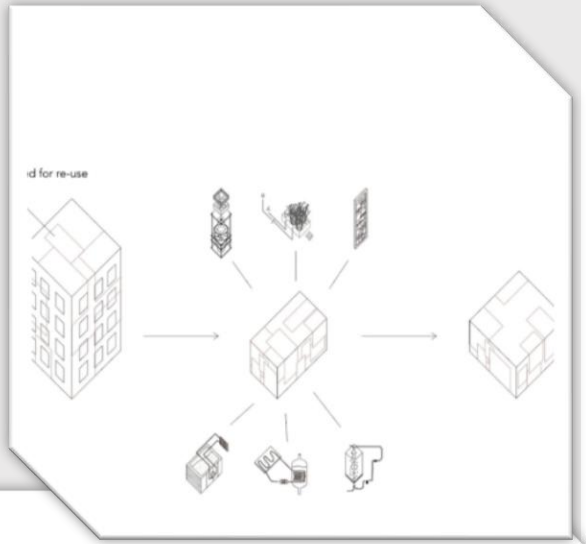


ENAC week
Teaching Unit

Land of a Thousand Dances
Design and build facilities while analyzing the effects of weather and climate on temporary structures

Quartier urbains, infrastructures et aménagements durables
Taught by an interdisciplinary team, this semester-long course focuses on the principles of sustainable urban development

Civil Engineering and SUSTAINABILITY



rebuiLT

Master Project in Civil Engineering

Prix BG Ingénieurs conseils

"Development of Interlocking Composite Bricks Made From Recycled Plastic and Construction Waste" – Selina Heiniger

The objectives of these bricks are:

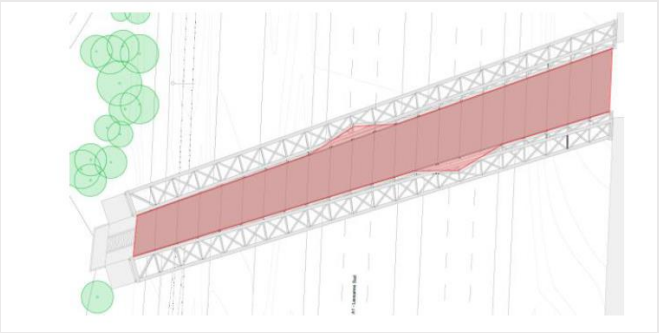
- Fabrication originate from plastic and construction waste
- Comparable strength, stiffness and water absorption rate to commonly used construction bricks
- Include mortar-free connection system
- Simple and reproducible manufacturing process
- Comparable or lower environmental impacts compared to commonly used construction bricks

Material characterisation	Polymer matrix testing	Composite mix testing	Brick wall testing	Life cycle analysis
				

Prix IIC – Institut d'ingénierie civile

"Conception et dimensionnement d'une passerelle" - Elena Canomeras

- Construction d'une passerelle piétonne reliant le futur quartier «En Dorigny» et le campus UNIL
- Zone à forte mixité fonctionnelle
- Coût de construction estimé à 4.8 Mio
- Structure mixte composée d'éléments en BFUP, en béton et an acier
- Structure principale composée de deux treillis tubulaires tridimensionnels torsadés en acier
- Forme torsadée des treillis développée dans un but d'intégration de la structure avec ses conditions d'appui
- L'addition de panneaux végétalisés permet de protéger les usagers des nuisances des voies de communication tout en apportant de la nature à l'ouvrage

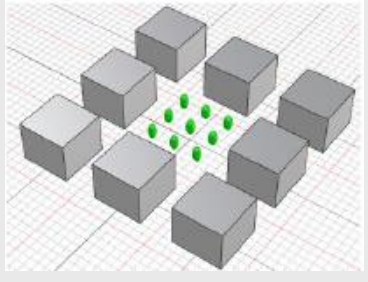


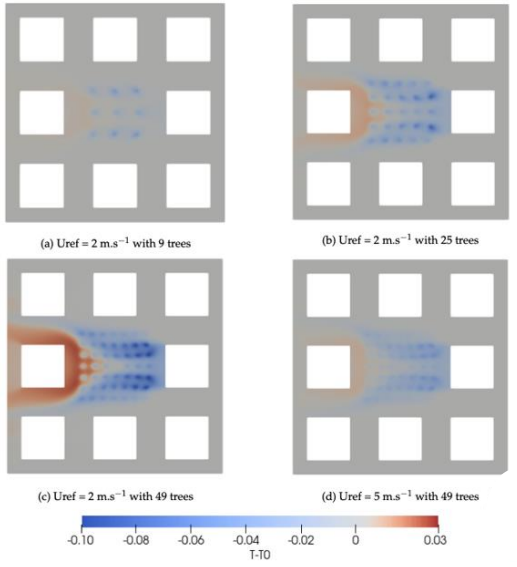
Master Project in Civil Engineering

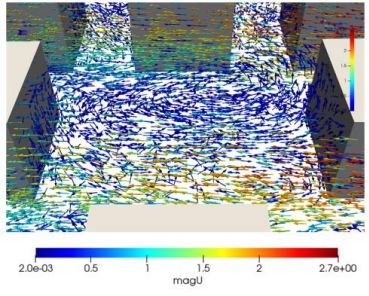
«Implementation and integration of an evapotranspiration model of vegetation in the Arup microclimate workflow»

Océane Martin

- Select an evapotranspiration model, implement it in the Arup microclimate worflow and validate it
- Apply it on a 3D generic urban geometry to comprehen the design, strategies available to reach local cooling
- Vegetation is the cheapest and most efficient way to mitigate the UHI.
- Plant evapotranspiration can locally cool down the air up to 6°







Master Project in Civil Engineering

«Motion Style Transfer: Modular Low-Rank Style Transfer for Deep Trajectory Forecasting» Danya Li

Challenge:

- Despite great success on large-scale datasets, deep forecasting models suffer from inferior performance when they encounter unseen novel scenarios

Research problem:

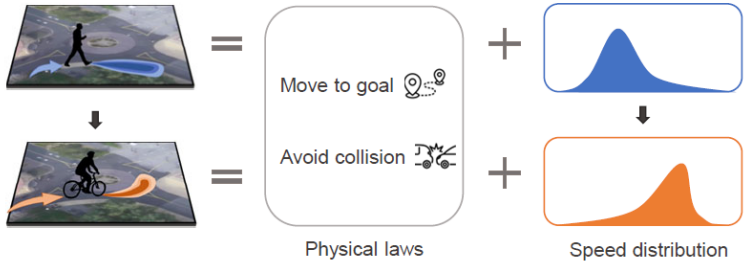
- Efficiently adapt a forecasting model pretrained on source domain with sufficient data to a target domain

Contributions:

- Formulate motion adaptation as style transfer
- Motion style adapters to model the style shifts
- Modularized strategy to improve sample efficiency

Decoupling motion dynamics

- Physical laws behind motion dynamics are invariant.
- Only need to account for the changes in motion style.



The EPFL Diploma in Civil Engineering

Guarantees an excellent scientific basis and a great capacity to understand and solve new complex engineering problems

Highly recognized diploma at national and international level

aaq
swiss agency of accreditation and quality assurance

Cti
Commission des titres d'ingénieur

ENAEE

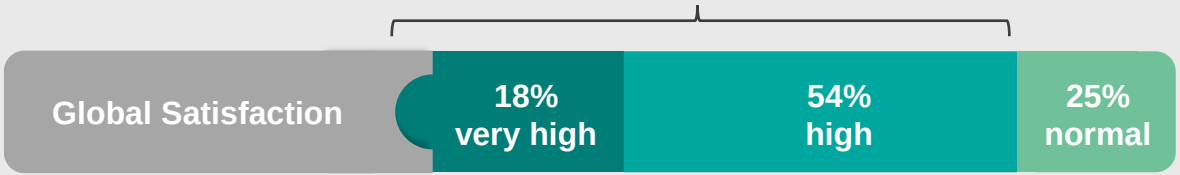
PROFESSIONAL ACTIVITY | DOCTORAL SCHOOL | POST-FORMATION

The professional insertion of the new EPFL graduates in Civil engineering

First job research:

Section (Master)	Average number of applications	Average period of job research, in weeks	Average number of proposed positions
Civil engineering	**4** (14)	**4.0** (14)	**2.0** (14)

Satisfaction at work (first job): **high to very high 97%**



Source: EPFL Career center, Promotion 2020

The civil engineer profile

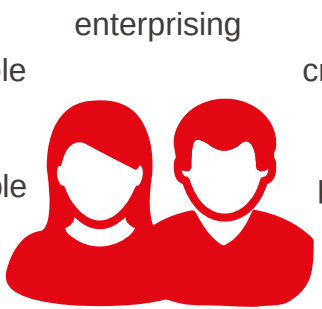
Professions

Design engineer
Field engineer
Operational engineer
Research and development engineer

Employers

Engineering consultants
Building firms
Administrations
Industries
Research centers
Governmental authority employers

Personnal qualities



Activities

Research
Planification
Conception, Design
Calculations, Modelling
Construction
Project Management
Maintenance

Projects

Bridges, Dams, Buildings
Water and Energy
Facilities
Transport infrastructures and systems
Resources management
Natural hazards and risks