Recommendations for Admission to the « diplôme d'ingénieur »
Economics, Management, Finance Department
International double-degree partners

The engineering programme at École des Ponts ParisTech prepares each student to become a real player in sustainable development and planning in all its dimensions. Engineers graduating from École des Ponts ParisTech are recognised by companies for their strong scientific skills combined with a capacity for practical implementation of knowledge and projects.

Engineering education at École des Ponts ParisTech leads to the development of skills in four dimensions:
- Advanced scientific and technical education: understanding and implementing conceptual, mathematical or numerical modelling approaches while knowing how to critically evaluate the results of a model is one of the foundations of the engineering profession that the School's training enables students to master.
- Project-based and on-the-job training: from the very first year, numerous collective or individual projects are developed, increasingly close to real engineering projects. For students entering the first year, four internships in laboratories and companies will punctuate the curriculum.
- Managerial, human and social skills: integrated from the first year, the human and social sciences give students an understanding of the world and the ability to take into account the problems of society. A solid knowledge of the business world is developed through courses, internships and projects.
- The ability to work in a team and to work internationally: 20% of teaching time is devoted to languages. International stays and contact with many foreign students enable engineering students to learn to work in a multicultural context.

In the context of admissions of international students from partner institutions, it should be specified that :
- The engineering degree from Ecole des Ponts ParisTech is a general engineering degree with prerequisites common to all teaching departments in the School's core disciplines: **Mathematics (Optimisation, Probability, Analysis and Scientific Computing), Continuous and Solid Mechanics, Quantum Physics and Statistics, Programming, Human and Social Sciences.**
- The vast majority of courses in engineering training are in French. A **B1 level in French** is therefore required to be proven by a certificate (TEF, TCF, DELF, DALF).
- A TOEIC score of at least 785 points (or an equivalent international test, such as TOEFL, IELTS or Cambridge Proficiency, CAE or FCE) is required in order to obtain an engineering degree from Ecole des Ponts ParisTech at the end of the course. For this reason, a **B1 level in English** is required for admission, to be proven by a certificate (IELTS, TOEFL, TOEIC, CAMBRIDGE).

In addition, each department of engineering education has specific prerequisites:

Economics, Management, Finance
<u>Economy</u>
- Fundamental tools of macroeconomic analysis and major current issues in contemporary macroeconomics (IS-LM model, causes and consequences of inflation and unemployment, impact of cyclical stabilization policies, structural wealth gaps between countries, growth, globalization and international trade)
- Microeconomic analysis tools: producer theory, consumer theory, perfect competition equilibrium, Pareto criteria, market failures

<u>Analysis and scientific computation</u>
Banach, Hilbert, Lebesgue and Sobolev spaces
Distribution theory
Bases of partial differential equations

<u>Fundamental numerical methods for the engineer</u>
Finite differences for time integration of evolutionary equations, finite elements for solving variational problems.

Optimization
- Kuhn and Tucker conditions: general case, and weak duality; convex case, and strong duality
- Algorithms for convex optimization
- Linear optimization
- Simplex algorithm
- Strong Duality

Probabilities
- Fundamental notions (probability space, random variable, law, expectation, ...)
- Usual laws with real and integer values.
- Concepts of convergence
- Strong Law of Large Numbers
- Central Limit Theorem
- Main algorithms for simulating random variables
- Monte-Carlo method