Building the worlds of tomorrow

THE SCHOOL IN FIGURES
2016-2017
Since 1747, École nationale des ponts et chaussées (École des Ponts ParisTech) has been training the best engineers, people capable of responding to the challenges of their time in the key domains affecting the day-to-day life of citizens and companies, in transportation, housing, energy, environment, urban services, and the associated public policies of spatial planning, sustainable territorial development, and the anticipation and management of environmental risks.

Today, it offers a set of educational programs of the highest level: engineering courses, Masters degrees, PhDs, Masters Spécialisés® (Advanced Masters), MBA programs, lifelong learning.

Working within the biggest industrial or service firms, in state organizations and local authorities, but also as business creators, Ponts et Chaussées engineers are equipped to perform in the highest managerial functions, to take the long view, with the clarity of vision and ingenuity inculcated by an education that is scientifically, technologically, and economically demanding, and open to society and the world.

Drawing on its worldwide reputation for excellence in the field of civil engineering, on the very high international caliber of its research activities, on the quality of its partnerships, particularly within Université Paris-Est, and on the support of ParisTech in the international sphere, École des Ponts ParisTech aspires to further broaden this recognition to all the fields associated with the city and with the environment, and with the engineering associated with them.

Armel de la Bourdonnaye
Director of École nationale des ponts et chaussées

A WORD FROM THE DIRECTOR

STUDENTS

- 854 engineering students
- 1,968 students, 25% of them female
- 123 enrolled in Masters programs, including 57 for double-degrees
- 20 enrolled in post-examination education as State Architects and Planners (AUE)
- 286 PhD candidates preparing theses in one of the School’s laboratories
- 393 on the MBA programs
- 292 registered in Masters Spécialisés® (Advanced Masters), including 50 public service students (including 3 City of Paris engineers, 12 state public works engineers, and 4 from École normale supérieure)

FACULTY

- 352 teachers heading modules
- 84 professors of the École nationale des ponts et chaussées, 4 assistant professors, and 96 lecturers
- 1,231 substitute teachers

RESEARCHERS AND DOCTORAL CANDIDATES

- 698 publications (WoS or Scopus), 42% of them with a foreign partner
- 425 Research and teaching staff
- 313 PhD candidates and postdocs
- €8.237 million partnership research, 45% directly with companies
INTERNATIONAL RELATIONS

62 partner universities in 33 countries on 4 continents

58 students on engineering courses abroad

42 double-degree agreements with universities in 24 countries

941 foreign students in 2016, 19% of them training for a double-degree in engineering

INTERNATIONAL RELATIONS

DEGREES AWARDED IN 2016

235 engineering degrees

107 Masters degrees

71 PhDs

234 Mastères Spécialisés® (Advanced Masters)

École des Ponts Business School MBAs

CAREER PATHS

AVERAGE SALARY IN FIRST JOB

€43,900

€49,000 including bonuses

THE SCHOOL IN NATIONAL AND INTERNATIONAL RANKINGS

International QS Rankings 2016-2017
• The only French institutions present in the world’s Top 400 are the écoles normales supérieures of Ulm, Lyon and Cachan, together with École polytechnique, CentraleSupélec, and École des Ponts ParisTech.
• The School is ranked in the top 10 Parisian universities.

International THE Ranking 2017
The only French institutions present in the world’s Top 400 are the écoles normales supérieures of Ulm, Lyon and Cachan, together with École polytechnique, CentraleSupélec, and École des Ponts ParisTech.

University of Shanghai International ranking 2016
École des Ponts ParisTech is ranked in segment 201 and in 300° place in the “Mechanical Engineering” category.

National (L’Étudiant/Express ranking 2017
The School is ranked 3rd equal. It is recognized as one of the best engineering schools, notably on the criteria of academic excellence, international openness, and contacts with the business world.

Source: 2016 survey of 2015 graduates (excluding civil servants)
The engineering degree program

FIRST YEAR
Consolidation of scientific knowledge, exposure, projects (research and departmental)
Work placement: the first year ends with 4 weeks of shopfloor work experience

THE MASTERS PROGRAM
2nd year: choice of a department for specialization
- Civil and structural engineering
- City, environment, transportation
- Mechanical engineering and materials science
- Industrial engineering
- Economics, management, finance
- Applied mathematics and computer science

2nd year internship:
Between the 2nd and the 3rd year, around 80% of the year group complete an optional long internship (1 year), more than 30% abroad.
Otherwise, students do a short internship (3 months) in a company or laboratory, 20% of them abroad

3rd year: End of Course Project (PFE):
For at least 4 months, students apply skills acquired in their program to a scientific or technical problem, in a company or research lab, individually or in a group (Multidisciplinary Engineer Project).

Masters programs

INTERNATIONAL MASTERS
- Renault Foundation Masters in Transportation and Sustainable Development (TRADD)
- Masters in Water, Soil and Waste Management and Treatment (GTESD)
- Masters In Mobility and Electric Vehicles (MVE)

MASTERS
- Applied Mathematics option
  4 specialist options
  - Applied Mathematics in Finance (MAF)
  - Mathematics, Vision, Learning (MVA)
  - Digital Analysis and Partial Differential Equations (ANEDP)
  - Operational Research (RO)

- Energy Option
  2 specialist options:
  - Durability of Energy-Related Materials and Structures (DMSE)
  - Decommissioning and Waste Management (DWM)

- Civil Engineering option (co-accreditation with UPEM and UPEC)
  3 specialist options including:
  - Multiscale Approaches for Materials and Structures (AMMS)

- Civil Engineering option (co-accreditation with UPEM and UPEC)
  3 specialist options including:
  - Mechanics of Soils, Rocks, and Structures in their Environment (MSROE)

- Materials Science and Engineering option (co-accreditation with UPEM and UPEC)
  2 specialist options including:
  - Materials Science for Sustainable Construction (SMCD)

- Transportation, Mobility, Networks option (co-accreditation with UPEM and UPEC)
  1 specialist option:
  - Transportation, Mobility (TM)

- Environmental, Energy, and Transportation Economics option (co-accreditation with Université Paris Saclay, Université Paris Ouest Nanterre La Défense, and EHESS)
  3 specialist options:
  - Environmental Economics
  - Energy Economics
  - Forward Modelling

- Environmental Science and Engineering option
  2 specialist options:
  - Aquatic Systems and Water Management (SAGE)
  - Ocean, Atmosphere, Climate, and Space Observations (OACOS)

- Quantitative Economics option
  2 specialist options:
  - Analysis and Political Economy (APE)
  - Public Policies and Development (PPD)

4 IDEFI (excellence initiatives in innovative education)
- Paris-Est d.school at école des ponts dedicated to training through “design thinking” in multidisciplinary teams. It fosters the design of innovative products or services, by matching user needs, feasibility, and economic viability.
- IDEA provides a range of innovative courses designed to improve the quality of teaching and to facilitate lifelong access to education and progress.
- **U-TOP** focuses on building a range of multi-partner and interdisciplinary distance learning programs.
- **FORC'AST** enables students to use cutting-edge digital tools to track and to map scientific or technical controversies.

**Mastères Spécialisés® (Advanced Masters)**

- **Full time**:
  - Public Policies and Actions for Sustainable Development with AgroParisTech
  - Urban planning and development
  - European civil engineering
  - Civil engineering for large energy structures with CentraleSupélec
  - Supply Chain Design & Management with IML
  - Urban Engineering and Information Technology (UrbanTIC) with EIVP
  - Engineering and Management of Logistics Systems with École Hassania des Travaux Publics (Morocco)

- **Part-time**:
  - Sustainable Real Estate and Building, energy transitions and digital technology; formerly IBE
  - Rail and urban transit systems with ENSIAME Université de Valenciennes and Hainaut Cambrésis, Université technologique de Compiègne, and ENTPE
  - Smart Mobility - Digital transformation of mobility systems with Télécom ParisTech: inauguration September 2017
  - BIM, Integrated Design and Life Cycles of Buildings and Infrastructures with ESTP Paris
  - Integrated Urban Systems with EIVP
  - Decision Support and Geo-located Information Systems with École Nationale des Sciences Géographiques (ENSIG - Geomatics)
  - Design by Data, Computational Design, Digital Manufacturing and Building Technologies
  - Infrastructure Project Finance

**The PhDs programs**

The research labs at École des Ponts ParisTech are a training ground for many PhD candidates.

- 286 PhD candidates present in 2017: 42% of foreign origin, 36% women.
- 71 theses defended in 2016

Eight main doctoral schools (ED) affiliated to the laboratories:

- **4 Université Paris-Est Doctoral Schools**:
  - City, Transportation and Territory; Sciences, Engineering and Environment; Mathematics and ICT; Organizations, Markets, Institutions.
- **4 Ile-de-France Doctoral Schools**:
  - Panthéon, Sorbonne, Economics; Agriculture, Biology, Environment and Health; Higher Studies in Social Sciences; Ile-de-France Environmental Sciences

**École des Ponts Business School**

École des Ponts Business School, AMBA accredited, offers a range of certificate and degree programs:

- Full-Time MBA in Innovation Management (Paris)
- Global Executive MBA (Paris, Franco-American double-degree with Temple University’s Fox School of Business, USA)
- Executive MBA in Smart Cities (Paris)
- Executive MBA in Railway & Mass Transit Management
- Executive MBA in Digital Transformation
- EHTP-Ponts Executive MBA (Casablanca, Franco-Moroccan degree)
- TEE Executive MBA (Beijing, Franco-Chinese degree)
- Executive DBA (Paris)
- “International Management Cycle” (cIM - open to engineering students and PhD candidates at ParisTech schools)

**Lifelong learning**

**Ponts Formation Conseil** is the leading lifelong learning body for engineering schools

- 12 certificates (École des Ponts ParisTech qualifications)
- 5 study days and scientific conferences
- 113 specific training operations commissioned by companies or public authorities, both in France and abroad
- 400 training sessions provided in France and abroad
- 5,800 participants (engineers and managers)
- 1,410 speakers (experts and professionals)
- 56.7% corporate participants from the private sector
- 43.3% participants from government bodies

**IHEDATE (Institute of Advanced Development and Planning Studies in Europe)**

IHEDATE’s annual training program is supported by the state (General Commission for Regional Equality, Ministries), regional groupings (ARF, AdCF), the City of Paris, private and public companies (Immochan, Caisse des dépôts, Colas, ERDF, EDF, Groupe La Poste, SNCF Réseau, Bouygues, RTE, SMABTP), and by professional bodies (ASFA, FNTP, USIRF, UIMM).
The laboratories

12 research laboratories, including 6 national research units (UMR) – individual labs or in partnership with academic entities, public bodies, and companies

4 FLAGSHIP DISCIPLINES
- Mathematics and computer science
  - CERMICS: applied mathematics, scientific calculus, modelling, optimization
  - LIGM: computer science, natural language analysis, image and signal processing, algorithms, formal calculus
- Mechanics and physics of materials and structures
  - NAVIER: mechanics and physics of materials and structures, applications to geotechnics, to civil engineering, to geophysics, and to oil development
  - LHSV: fluid mechanics applied to hydraulics and the environment (riverine, coastal, and harbor zones)
- Environmental sciences and engineering
  - CEREA: air quality, pollutant dispersion and transmission, atmospheric modeling at urban and regional scale, data assimilation
  - CIRED: developmental and environmental economics, issues of energy/waste/transportation/water/food, global environmental issues, precautionary principle, modelling
  - HM&Co: multiscale observation and analysis, system-based modelling, managing water as a risk and resource, hydrology for a resilient city
  - LEESU: the urban milieu and its environment, analysis of urban and periurban territories in their sociotechnical and environmental behavior
  - LMD: atmospheric dynamics, study of climate and its interannual fluctuations, continental and global scales
- Economics & social sciences
  - LATTs: social sciences, spatial planning, history, dialogue between social sciences, technology and engineering, in both companies and government bodies
  - LVMT: analysis and modelling of the interactions between transportation and spatial planning
  - PjSE: theoretical economics – public and labor market economics

4 socio-economic priorities for ecological transition:
Research activities contribute to tackling the challenges of 4 socio-economic priorities of sustainable development:

- City and mobility systems
- Management of risks, resources, and milieus
- Industry of the future
- Economics, practices, and society

Programs that structure the scientific communities

- Bézout (LabEx): Deterministic and stochastic models, discrete mathematics and algorithms, large dimension phenomena, imaging and geometry
- Urban Futures (LabEx): Environment, transportation, planning, architecture for urban worlds
- L-IPSL (LabEx): Climate change and consequences at the relevant spatial and time scales for political and economic decision-making
- MMCD (LabEx): Multiscale modelling and testing of materials for sustainable construction, properties of civil engineering and environment materials
- OSE (LabEx): Economics, globalization and development, markets and organizations, foundations of individual, strategic, and social behaviors
- SITES (LabEx): Science and technology, society, research and innovation processes and policies
- EEXP (LabEx): Spatial exploration of planetary environments
- Efficacity (ITE): Institute for the City Energy Transition – founding member
- Advancity (competitiveness cluster): Sustainable city and mobility

The industrial chairs

CITY AND MOBILITY SYSTEMS
- Innovative Solutions for a Sustainable and Responsible Habitat: with Saint-Gobain
- Transportation Infrastructure Management: with abertis and IFSTTAR
- Reinventing stations in the 21st century (LVMT): with SNCF Gares & Connexions
- Sciences for rail transportation (NAVIER): with Eurotunnel

MANAGEMENT OF RISKS, RESOURCES AND MILIEUS
- Fluid mechanics applied to hydraulics and the environment (LHSV): with EDF
- Hydrology for a resilient city (HM&Co): with Veolia
- Financial risks (CERMICS): with the Risk Foundation and its founder Société Générale, École polytechnique, and UPMC

INDUSTRY OF THE FUTURE
- Operational Research and Learning (CERMICS): with Air France
- Materials Science for Sustainable Construction (NAVIER, CERMICS): with Lafarge
- Sustainability of Energy-Related Materials and Structures (NAVIER): with the European Foundation for Tomorrow’s Energies, EDF, ENHIE, GRT Gaz, and MINES ParisTech
- Eco-design of buildings and infrastructures (LVMT): with Vinci, AgroParisTech, and MINES ParisTech
- Building sustainably and innovating (NAVIER, LIGM): with Bouygues, CSTB, and CentraleSupélec

ECONOMICS, PRACTICES AND SOCIETY
- Forward Modelling for Sustainable Development (CIRED): with EDF, Total, Schneider Electric, ADEME, and MINES ParisTech
- Socio-Economics and Modelling of Public Urban Passenger Transit (LVMT): with STIF
- New economic approach to territorial mobilities (LVMT): with SNCF, IFSTTAR and UPMC
THE LEARNING CENTER, THE SCHOOL’S PEDAGOGICAL RESOURCE CENTRE
- 172 seats, 4 carrels, individual workspaces, 5 project rooms for group work
- 33,000 visits a year, 6449 registered users, 10,170 documents provided every year
- 90,000 documents at Bachelors, Masters, and research level
- 14,500 e-books, 15,000 electronic journal titles
- 92,000 hits on the document portal bibliotheque.enpc.fr and its search engine search.enpc.fr, 370,000 pages viewed on the digital library platforms
- 207,000 documents covering the School’s fields of teaching and research
- an accredited branch of France’s National Library for civil engineering and construction

TARGETED SERVICES FOR RESEARCHERS
- access to the main scientific journal platforms and scientific, technical, and economic databases (Web of Science, Scopus, Business Source Complete, Mathscinet, Science Direct, Springer, Wiley, ASCE…)
- A dedicated site for access to resources at espacechercheurs.enpc.fr
- the hal-enpc.archives-ouvertes.fr open archive containing more than 18,800 stored scientific publications
- the Opalia bibliometric platform

AN EXCEPTIONAL LEGACY AND HERITAGE
- a collection of 80,000 documents, manuscripts, and prints from the 18th to the 20th centuries
- digitized library collections: patrimoine.enpc.fr, bibliothequedesphares.fr, gallica.bnf.fr, archive.org, photo-arago.fr for photographic collections
- a photo library of 13,000 images (bridges, canals, stations, portraits of engineers…)
- 14,000 archive dossiers
- museum collections, a record of the history of France’s first engineering school

PERSONNEL AND RESOURCES

530 staff employed by the institution and its subsidiaries as of December 31, 2016 (excluding substitute teachers and civil servants in training).

Including 207 researchers

PRE-TAX REVENUES OF SUBSIDIARIES IN 2016

Pont Formation Conseil
€6.5 million
MIB Développement
€2 million

€43 million
in resources

€0.5 million
Apprenticeship tax
€4.5 million
Various
€4.3 million
Tuition fees
€26.5 million
Public service subsidy from sponsoring ministry – MEEM
€7.21 million
Research contracts (sponsorship: €1.1 million)
FONDATION DES PONTS

A recognized public interest entity, the Foundation collects contributions from companies, graduates, and friends of the School who, through their donations, help the School to be ever more open to the world of today, more innovative and effective, and so to maintain its image of excellence in conditions of ever-growing international competition.

Since 2006, more than 600 graduates from year groups 1934 to 2016 and 70 companies or organizations, both private and public, have given their support to the development of education, research, innovation, and entrepreneurship, and have helped the best students gain access to the School’s programs.

Resources collected in 2016 (net of management costs)
- donations by individuals: €307,000
- chairs or partnerships: €1.1 million

Use of donations:
80%: Research, teaching, and innovation (chairs, Paris-Est d school at École des Ponts)
20%: Excellence prizes, international mobility and social diversity (scholarships, loans)

PONTS ALLIANCE

Ponts Alliance, a public interest entity established in 1860, encompasses the School’s 20,000 graduates: civil engineers, state engineers, holders of Masters degrees, PhDs, or MBAs.

The alumni network, run by Ponts Alliance, is present in 109 countries and in all the School’s sectors of activity. It notably encompasses 22 geographical groups, 17 professional groups – three of them jointly with other grandes écoles – and 6 social clubs.

PRESSES DES PONTS

Established in 1977, Presses des Ponts has a catalog of 220 books and scientific and technical software applications, primarily in the fields of civil and structural engineering, and of spatial planning.