CAREER PROSPECTS

The array of business sectors of interest is extremely wide and concerns large industrial groups as much as SME/SMIs, research centres or start-ups.

TARGETED POSITIONS

- Data Manager
- Data Architect
- Data Analyst
- Data Scientist
- Data Designer
- Biostatistician
- BI Manager
- Chief Data Officer
- Data Protection Officer
- Data Auditor

FIELDS

- Companies in the digital industry
- Insurance and health companies
- Banks/ Financial industry
- Sales, distribution/ Marketing
- Medical/ pharmaceutical industry
- Energy
- Communal services
- Industry
- Transport industry
- Life sciences
- Natural Sciences
- Engineering
- Journalism

PROJECTS

A project is carried out each academic semester in collaboration with a company. **It is used as a guideline for the whole semester and enables the implementation of many courses**.

Several examples of possible projects:

- **Studying** the conducive physical and chemical conditions for algae "blooms" in lakes
- **Anticipating** capacity of intermittent energies (solar, wind...)
- **Developing** new services based on the Metropolis' OpenData.

ANY **QUESTIONS**?

Antoine GADEMER
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For further information please check the "Application process for international students" section on our website www.epf.fr/en

Vincent PLOUCHARD
3rd year student
(2021 School Year)

During the execution of my sensor or program-oriented projects at EPF, I noticed that the growing interconnection between devices led to an ever-increasing volume of digital data and my curiosity was heightened. Moreover, I noticed that data analysis had applications in many fields such as marketing, online business, health or optimisation of logistical resources thus confirming my career choice as a general engineer.

This is why I chose the Data Engineering Major in Year 4 in order to get operational expertise in Big Data, machine learning and data processing to answer companies' real needs whilst increasing knowledge in two subjects I enjoy: IT and mathematics.

*The fact that **this major sets these applications in an ethical, ecological and legal context** seems very interesting and relevant to me, as they are in my opinion tomorrow's society's key issues.*

***The courses entirely taught in English are to me an additional advantage**, as English is de facto, the language of new technologies and a connection to the world.*

Officially recognized foundation - Graduate school of engineering since 1925 - Accredited by the French accreditation board, CTI

EPF
GRADUATE SCHOOL OF ENGINEERING

MACHINE LEARNING
DATA SCIENCE
VISUALISATION
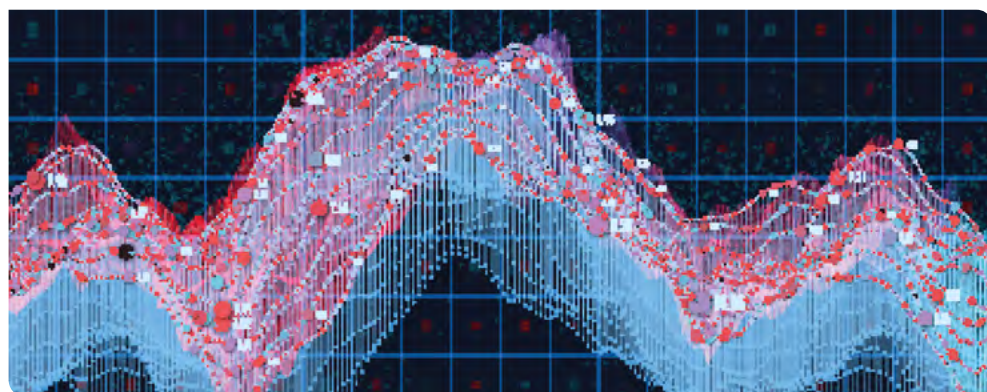STATISTICS & OPTIMIZATION
DATA ANALYSIS
DATA ENGINEERING MAJOR
GREEN IT
ETHICS, LAW & POLICY
BUSINESS INTELLIGENCE
DATA GOVERNANCE

PROGRAM **AIMS**

The aim of the Data Engineering major is to train flexible and adaptable engineers, able **to help companies and laboratories to structure and add value to their data**. Emphasis is placed on a systemic approach including **legal, ethical, economic and environmental aspects**.

Graduates of this major acquire scientific, technical and managerial expertise based on:

- A **global approach of the data value chain**: Recovery, Structuring, Analysis, Use and Governance
- **Ethical, legal, economic and environmental** aspects of data exploitation

Graduates will have **competences in mathematics** (statistics, decision theory, modelling), **IT** (IS, script language, mining and visualisation tools, learning) **as well as knowledge in contextualization** (Green IT, law and ethics, business, scientific applications).

PROGRAM **STRUCTURE**

The major extends over two academic years and is organised around two in-class semesters, framed by two internship semesters. (Note : For the international students, the first internship is replaced by an International Project semester which includes mechanics, energy, computer science and French.)

All the CUs are offered **in English**. They are designed as independent credits so as to admit students from other programs or students attending vocational training.

In order to be as close as possible to employment conditions, CUs use one project approach, thus confronting students to real requirements specifications, teamwork and self-containment.

COMPULSORY CUs – **YEAR 4**

TECHNICAL COURSE UNITS

Information Systems for Data | 64 h | 5 ECTS

Programming & IT Management Data Streams (Data sources & Distributed computing and storage)	Understanding the resources and tools behind any Data Framework.

Data architecture | 64 h | 5 ECTS

Data Models Data Storages	Physical considerations and design rules for storing (a lot of) data.

Mathematics of Decision Making | 64 h | 5 ECTS

Linear Algebra, Statistics & Probability Optimization : analytics and numerics Introduction to Computational Thinking	The Maths behind the magic, Data analysis 101.

CONTEXTUALIZATION COURSE UNITS

Data & Earth : issues and perspectives | 64 h | 5 ECTS

Ecological impact of IT Data for Earth (Remote sensing, GIS, ...)	The paradoxes of digitalisation. What can Data do for the planet ?

Company Knowledge | 64 h | 5 ECTS

Business operation & business skills Companies's visits English	How companies work and how to learn buisness expertise. Conflict and change management.

Project | 150 h | 5 ECTS

COMPULSORY CUs – **YEAR 5**

TECHNICAL COURSE UNITS

Data Curing & Quality | 64 h | 5 ECTS

Data Curing & Auditing Dimensionality reduction	Mitigating the Data imperfections. How to cope with heterogeneous, multidimensional data ?

Data Analysis, Visualization and Machine Learning | 64 h | 5 ECTS

Machine Learning Data Visualisation & Data Design Computational Thinking	From Data to Information : give sense with classification & visualisation.

Neural Networks and Deep Learning | 64 h | 5 ECTS

Neural networks and non parametric modeling Applied case with Keras & Tenserflow	Neural network for fun and profit. Processing texts & images, Predicting.

CONTEXTUALIZATION COURSE UNITS

Ethics, Law and Policy | 64 h | 5 ECTS

Data & Ethics Privacy by design & Open-data Security by design	Real world problematics : take a step back from technologies.

Business & Data governance | 64 h | 5 ECTS

Challenge Data Science Data Governance	Real world problematics : from Information to Strategy.

Project | 150 h | 5 ECTS