
INTERNATIONAL EXCHANGE PROGRAM
GRADUATE PROGRAM TAUGHT IN ENGLISH

BIG DATA & DATA SCIENCE

**A COMBINED MATH AND COMPUTER
SCIENCE MASTER PROGRAM**



MINESnancy
ARTEM

1

MEET THE EXPERTS

Learn from an internationally renowned faculty involved in top class laboratories at the forefront of innovation.

2

ACQUIRE AVANCED SKILLS...

...to tackle engineering challenges with highly Selective Combined Math and CS Curriculum based on a combination of theoretical, computational and experimental methods.

3

PERSONALIZED TUTORING

Personalized Tutoring in Small Groups.
Individual and personalized support throughout the mobility.

4

RESEARCH AND INNOVATION

Benefit from our relations with a world class research environment:
Institut Élie Cartan de Lorraine & Loria.

8 REASONS FOR STUDYING AT MINES NANCY!

5

PREPARE YOUR FUTURE CAREER

60% of students hired before graduation: Mines Nancy offers close interaction with industry, through lectures given by our industrial colleagues and the possibility to perform research projects in collaboration with industrial partners.

6

LIVE A MULTICULTURAL EXPERIENCE

This English curriculum is open to and popular with local French students. You will also mix with students from all around the world, as 25% of Mines Nancy students come from over 20 different countries.

7

MINES NANCY WELCOME PACK

The teachers, staff and students of Mines Nancy are looking forward to welcoming you. Many services and social events are organized for international students to help you settle in and feel comfortable. An optional French summer school is also available for you to feel even more at ease.

8

ENJOY NANCY

Nancy is renowned throughout the world for its Unesco-listed Place Stanislas. This Capital of Lorraine is a wonderfully charming and dynamic city with more than 40000 students. There are more than 60 clubs and student societies at Mines Nancy (sports, arts, social events, professional activities...).

WHY MINES NANCY?



Antoine Henrot
Head of program

This International Program offered by Mines Nancy on «Big Data and Data Science» has the unique feature of being directed by both the Mathematics and the Computer Science Department, thus guaranteeing an outstanding level in both domains. It is associated with the IECL and Loria facilities conducting world class research in these areas. The program is also sponsored by Saint-Gobain Research within the «Big Data Chair» agreement with Mines Nancy.



Bart Lamiroy
Head of program

The «Big Data and Data Science» curriculum is both a Master level program for the French students at Mines Nancy, and a track for foreign exchange students. While the courses are given in English for convenience, students are entirely integrated with French students during sessions and have the opportunity to fully experience French way of life and studies.

EMBRACE THE WORLD OF DATA!

The digital transformation of the world economy provides us with tremendous amounts of data. The capacity to leverage these data and transform them into information is offering a wide range of opportunities for new markets, services and improved decision making.

Cutting edge research in Applied Mathematics (Statistics and Optimization) and Computer Science (Machine Learning, Knowledge Mining, High Performance Computing) has been competing with corporate stakeholders **to develop tools and techniques for the management of these data troves.**

The aim of this program is **to confront these techniques and their applications, as well as their more fundamental underlying theories** to modern issues of data science.

At the end of the year, **the students will be able to work in many areas** as data scientists endorsed by one of the most prestigious French Graduate Schools Of Science, Engineering and Management.

PROGRAM ID

Language

English

Duration

2 semesters:

- 1 semester course: September - February
- 1 semester internship: March - August

ECTS

60 ECTS

Prerequisites

Equivalent of European Master 1 level in Applied Mathematics or Computer Science with excellent academic records.

Program schedule

- Data Mining
- Machine Learning
- Scalable Distributed Architectures
- Knowledge Extraction
- Optimization
- Ethics
- IT System Management
- Tutored Project
- Industry and Business project & seminars
- 6 Months Research Internship in Partner Labs or Industry

PROGRAM

Aims and skills

This program offers the enrolled students an in-depth focus on the mathematical foundations of Data Mining and Numerical Optimization underpinning Machine Learning and Knowledge Extraction theories and techniques, as well as an overview of the technical architectures supporting high performance distributed data processing and computation.

Program Schedule

Module 1: Data Mining (42h - 4 ECTS)

- PCA
- Correspondance and discriminant Analysis
- Classifications
- Segmentation

Module 2: Machine Learning (21h - 2 ECTS)

- Classification
- Dimensionality Reduction
- Feature Extraction & Feature Learning
- Deep Learning

Module 3: Scalable Distributed Architectures (21h - 2 ECTS)

- High Availability, High Throughput, Distributed Storage
- Scalable Distributed Computing
- MapReduce
- NoSQL

Module 4: Knowledge Extraction (21h - 2 ECTS)

- Symbolic data mining
- Knowledge representation
- Pattern extraction
- Formal Concept Analysis

Module 5: Optimization (36h - 4 ECTS)

- Theoretical results for unconstrained and constrained optimisation
- Gradient methods
- Penalization, duality
- Formal Concept Analysis

Module 6: Ethics (21h - 2 ECTS)

Module 7: IT System Management (42h - 4 ECTS)

Tutored Project (100h - 8 ECTS)

Industry and Business project & seminars

Artem Insight (1 ECTS) 1 week dedicated to the development of one project proposed by an enterprise or an organization

Economics, Organization, Business seminar

(1 ECTS) 1 week dedicated to seminars in the field of Economy, Organization or Business

Research Internship (30 ECTS)

6 Months Research internship in Partner Labs or industry

French Summer School

Date: From July until end of August 2017

On an optional basis, Mines Nancy proposes a French Summer School to provide international students with the necessary skills in French. These courses are also tailored for engineering studies (methodological tools, professional language...).

Fees and registration procedure will be given in due course by Mines Nancy.



HOW TO APPLY?

Application deadline

Application for enrollment in September (semester 1): **15th April**

Application

- **Application form duly completed**
- **Official transcripts** (in English)
- **CV and cover letter** (in English)
- **Copy of passport**
- **Proof of Language Proficiency** (compulsory minimum B2)

Entry requirements

Candidates should have achieved at least 4 years of higher education or M1 with a solid background in mathematics, statistics, computer science, engineering science.

FEES AND FUNDING

according to 2016/2017 fee regulations

Within a bilateral agreement

Erasmus exchange students: Free

Non-EU exchange students: Free

excluding compulsory National French Health Insurance (215€ in 2016/2017)

Free movers

EU/EEA: 610€

excluding compulsory National French Health Insurance (215€ in 2016/2017)

Overseas: 610€

excluding compulsory National French Health Insurance (215€ in 2016/2017)

Additional services for all students

Additional fees (500€) will apply to all students once admitted in this program, on registration.

Funding

Funding program awarded on the base of academic excellence.

Lifelong learning

Tuition fees: 7416€

excluding registration fee (610€ in 2016-2017)

CONTACT

International Office:

mines-nancy-dai@univ-lorraine.fr

Student Mobility Coordinator, Incoming Students:

Marion Carrey

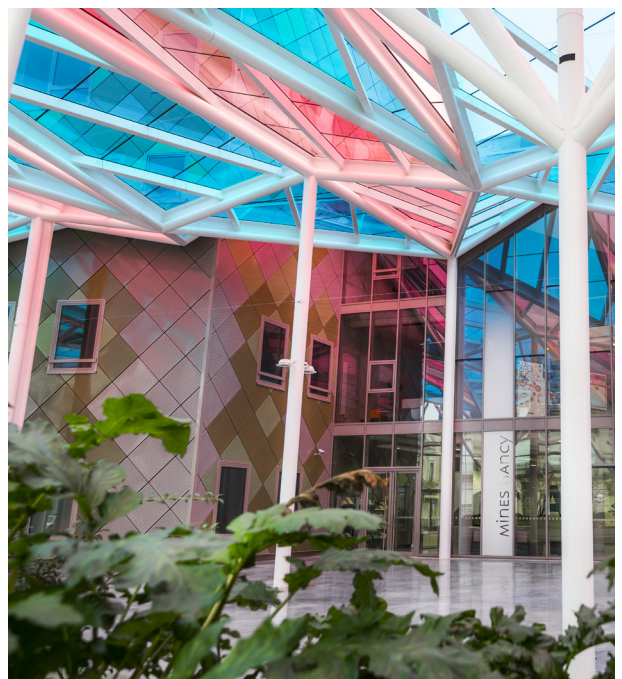
marion.carrey@mines-nancy.univ-lorraine.fr

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WELCOME PACK

Mines Nancy offers individual and personalized support throughout the mobility.

- **Accommodation & administration support** (immigration, registration...)
- **Personalized welcome from the railway station to accommodation**
- **Help with arrival in Nancy** (bank account, insurances, phone, internet...)
- **Educational mentoring**
- **Buddy programme**
- **International week end**
- **Social & cultural activities**
- **Intercultural Days**
- **French Summer School**





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