



Ecole  
Internationale  
des Sciences  
du Traitement  
de l'Information

# MASTER in BIG DATA

**Data Analytics, Data Science, Data Architecture**

ACCREDITED BY THE FRENCH MINISTRY OF HIGHER EDUCATION AND RESEARCH

The EISTI, an engineering school with two tracks in Computer Science and Applied Mathematics, offers an international Master's Degree in "Big data : Data Analytics, Data Science, Data Architecture", taught in English.



**Cergy-Pontoise,  
near Paris**

This Master draws on the recognized excellence of our engineering school in business intelligence and has grown from the specializations in Decision Support, Business Intelligence and Business Analytics.

The EISTI is acknowledged as the best in France by independent organizations.

The 3 pillars of the Big Data Master:

- Modeling, operational research and decision support
- Data exploration and data mining
- Business Intelligence

## OBJECTIVE

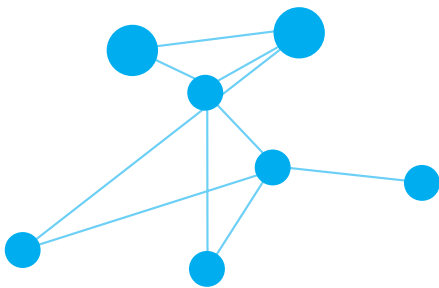
Business Intelligence (BI) and now Business Analytics have become key elements of all companies. The objective of this Master is to train specialists in information systems and decision support, holding a large range of mathematic and computer-based tools which would allow them to deal with real problems, analyzing their complexity and bringing efficient algorithmic and architectural solutions. Big Data is going to be the Next Big Thing over the coming 10 years.

The targeted applications concern optimization in the processing of large amounts of data (known as Big Data), logistics, industrial automation, but above all it's the development of BI systems architecture. These applications have a role in most business domains: production, logistics, finance, marketing, client relation management. The need for trained engineering specialists in these domains is growing constantly: recent studies show a large demand of training in these areas.



## SPECIFICS DETAILS OF THE MASTER

- The triple skill-set with architecture (BI), data mining and business resource optimization.
- This master will be run by a multidisciplinary group: statistics, data mining, operational research, architecture.
- The undertaking of interdisciplinary projects.
- The methods and techniques taught in this program come from cutting-edge domains in industry and research, such as: opinion mining, social networks and big data, optimization, resource allocation and BI systems architecture.
- The Master is closely backed up by research: several students are completing their end-of-studies project on themes from the L@RIS laboratory, followed and supported by members from the laboratory (PhD students and researcher teachers).
- The training on the tools used in industry dedicated to data mining, operational research and Business Intelligence gives the students a plus in their employability after completion.



## INTERNSHIP

The internship is followed by a referat at the school. There needs to be at least 3 meetings with the intern, the referent and the person in charge in the company/research laboratory. Each meeting will lead to a (professional) presentation by the intern which will end in an evaluation. As well as these meetings, the student will have to write up an internship report. This internship will last for a minimum of 22 weeks.

## INDUSTRIAL PARTNERSHIP

SAS via the academic program and a 'chaire d'entreprise' (business chair), allowing our students access to Business Intelligence modules such as Enterprise Miner (data mining) and SAS-OR (in operational research).



## ORGANIZATION

### M1 Program

The M1 gives the necessary bases in computer science and mathematics for the M2. As well as the bases, students will find indispensable elements of project management. This first year will culminate in a large transversal team project.

### M2 program

In order to train experts in this domain, they need real skills in modeling, design and production in computer architecture, data analysis and exploration and optimization. This master is a combination of courses and a five month internship.

**M1, FROM SEPTEMBER TO JUNE**

SKILLS	COURSES	HOURS	ECTS
<b>Data Exploration</b>	Inferential Statistics	30	3
	Data Analysis	24	2
	Introduction to Prediction Models	21	2
	Introduction to Data Mining	21	2
<b>Mathematics for Computer Science</b>	Partial Differential Equations & Finite Differences	30	3
	Operational Research: Linear Optimization	20	2
	Combinatory Optimization	18	2
	Complexity Theory	9	1
	Simulation and Stochastic Processes	30	3
	Deterministic & Stochastic Optimization	30	3
<b>Software and Architecture</b>	Object-Oriented Modeling (OOM) with UML	30	3
	Object-Oriented Design & Programming with Java	30	2
	Relational Databases: Modeling & Design	30	3
	PLSQL	21	2
	Architecture & Network Programming	30	3
	Parallel Programming	30	3
<b>Engineering Science</b>	Signal & System	21	3
	Signal Processing	30	3
<b>Research Initiation</b>	Scientific Paper Review	9	1
<b>Project Management</b>	AGIL Methods & Transverse Project	21	2
<b>Final Research</b>	Final Project: Big Data research	50	5
<b>French and Workshop</b>	Personal and Professional Project	15	1
	FFL: French as Foreign Language	61	6
<b>TOTAL M1</b>		<b>611</b>	<b>60</b>

**M2, FROM SEPTEMBER TO MID-APRIL (46 ECTS) AND FROM MID-APRIL TO SEPTEMBER**

SKILLS	COURSES	HOURS	ECTS
<b>Computer Technologies</b>	Web Services	24	3
	NOSQL	20	2
	JEE	24	3
<b>BI Architecture</b>	BI Theory	20	2
	BI Practice	20	2
<b>Data Exploration</b>	Data Mining: Applicative Approach	20	2
	Semantic Web & Ontology	20	2
	Social Network Analysis	18	2
	Collective Intelligence: Web Mining & Multimedia Indexation	20	2
	Entreprise Miner SAS	20	2
	Text Mining and Natural Language	20	2
<b>Operational Research</b>	Thorough Operational Research: Modeling & Business Applications	21	2
	Games Theory	10	1
	Forecasting Models	20	2
	Constraint Programming	20	2
	Multi-Objective & Multi-Criteria Optimization	20	2
	SAS OR	20	2
<b>Research Initiation</b>	Scientific Paper Review	10	1
<b>Final Research</b>	Final Project : Big Data Research	39	2
<b>French and Workshop</b>	FFL: French as Foreign Language	81	4
	CV Workshop	9	
	Personal and Professional Project	15	
<b>Training</b>	Internship	22 weeks	9
<b>Thesis</b>	Master Thesis	150	9
<b>TOTAL M2</b>		<b>641</b>	<b>60</b>



## TEACHING

All the classes will be taught in English except:

- FLE (French as Foreign Language), where the objective is to teach the students how to understand and express themselves in French.
- Cultural Openness, where the objective is to enrich the students' knowledge of French culture.

### E-learning Area

The EISTI offers an e-learning site to all its students, which complements everything the students will learn through their presence and participation in class:

- Class documents, practical work and tutorials online
- Questions and discussions between teachers and students, and among students
- A possibility of handing work in online



All Master's students are equipped with a laptop for the duration of the program that remains the property of the EISTI.

## PROFESSIONAL FUTURE

A large number of companies need BI systems in order to pilot their activities. Both public and private organizations need to take into consideration more and more constraints: new, stricter rules and regulations, heightened competition, needs for multiple optimizations, etc.

The specialists in this area are looking for people specialized in the domains of analytics, such as statistics, prediction, data mining, operational research etc. to meet the problems and needs of large companies in areas such as risk, fraud, customer relations and marketing, etc. The growing and large demand in these domains gives the students from this master course diverse and varied job opportunities – they could find a job in the area linked to decision support as a Data Scientist, a consulting engineer, research and development worker, tool design engineer, BI/ Business Analytics solutions-provider or simply a user of Business Intelligence tools. For those who want to stay in the area of research, they could further their career in both public and private research centers, find a position in higher education or prepare a PhD.

## TUITION FEES

The overall cost of this master for the two years is €14,000 (€7,000 per year).

## SCHOLARSHIP

Excellence and Honor scholarship are available for high profile students.

## ENTRY REQUIREMENTS / ENROLLMENT

This international program is for any student holding a BSc in Computer Science or equivalent or for high-potential foreign engineers who are looking for an international career in the domain of business analytics, business intelligence and big data.

Depending on the profile, students will be admitted in M1 or directly in M2. For non-native English speakers, the candidates must prove their level of English with their application. As proof we accept:

- TOEFL (Test of English as a Foreign Language): Minimum Score 80
- TOEIC (Test of English for International Communication): Minimum Score 800, or other equivalent tests.

**Dossier to be downloaded on our website and sent to EISTI.**

## CONTACTS

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For any further information on the program:



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