

# DATA INTELLIGENCE



## OBJECTIVES

In a competitive and rapidly evolving environment, the companies have to monitor frequently their activities and control their business surrounding. For that, the extraction of knowledges is crucial from internal & external source of data coming from numerous information systems. The Data Intelligence major offers

multidisciplinary engineering training in Computer Science and Statistics in order to masterize the collection, storage and analysis of big data and provides essential results for decision-making.

## JOB PROSPECTS

Data scientist, data analyst, data Engineer, database administrator, Data Architect, Business Analyst, datawarehouse engineer, decisional engineer, R&D Engineer.

# COURSE CONTENT

## SEMESTER 1

### PROJECT-BASED LEARNING IN WEB DEVELOPMENT

- Database management system : relational and object models, database schema, queries analog filter, power management
- Web architecture : client, server, communication protocolsensor management, bluetooth link
- HMI : ergonomoy, dynamic contents generation, formatting
- Propagation & Antenna, Digital transmission, Link budget

### NETWORK FUNDAMENTALS

- Network communication, communication channel
- Layer approach, OSI model, TCP/IP model
- Network devices, Network addressing models

### CYBER SECURITY

- Information systems security
- Web application and network security
- Introduction to Cryptography, etc.

### JAVA/SOFTWARE ENGINEERING

- Java programming
- Software engineering
- Agile software development methods

### DATA SCIENCE FUNDAMENTALS

- Probability theory
- Statistics (descriptive statistics, statistical theory of estimation, hypothesis testing)
- Data science (principal component analysis, linear regression)

### ENGLISH, FRENCH AND HUMANITIES COURSES

## SEMESTER 2

### DATA ANALYSIS

- Univariate to multi-variate statistics
- Data visualization
- Introduction to clustering
- Time series analysis
- Data analysis with Python
- Introduction to classification

### METHODS AND TOOLS FOR BI

- Business Intelligence
- Decision process
- Data warehouse, data mart, data cubes
- ETL: extract transform and load

### DATABASES AND BIG DATA

- Advanced querying techniques
- Non-relational databases

### AI AND OPTIMISATION

- Unconstrained optimization
- Constrained optimization
- Dynamic optimization
- Global optimization
- Optimization for Machine Learning

### ENGLISH, FRENCH AND HUMANITIES COURSES

#### CHOOSE ONE COURSE BETWEEN:

### INTERNATIONAL BUSINESS INNOVATION PROJECT

- Build real business model in a multicultural team
- Create innovative idea with marketing & business strategies
- Present final business model to professionals

### INTRODUCTION TO RESEARCH

- Definition of research: procedures, organization and purposes
- Targeting information (specialized sites, books, open archives, etc.)
- Bibliographic study: synthesis of the research works
- Modeling a scientific problem
- Writing a scientific publication
- Ethics, integrity and scientific rigor

## SEMESTER 3

### MACHINE LEARNING

- Linear predictors, convex learning
- Gradient descent, kernel methods
- Support vector machine, decision trees

### SEMANTIC WEB AND KNOWLEDGE MANAGEMENT

- XML, Xquery, Xpath, XSLT
- RDF (Resource Description Framework) and RDFS
- Open Linked data
- SPARQL, Triple stores
- OWL, TF.IDF, ElasticSearch, Solr

### PROJECT

The project is composed of an advanced case study. The students will be called upon to use the knowledge, design techniques and tools that they learnt through their courses

### ENGLISH, FRENCH AND HUMANITIES COURSES

### CHOOSE TWO COURSES AMONG:

### AUDIT AND RISK MANAGEMENT

- Data security, Secure Programming
- Main application vulnerabilities (Cross scripting (XSS), SQL injection, ...)

### SMART CITIES / CONNECTED AND AUTONOMOUS VEHICLES

- Challenges of the smart city
- Instructions for a stronger economic development
- Industry 4.0 market technical
- Smart Transportation
- Aviation market techno-economic analysis

### GLOBAL HEALTH SYSTEMS

- Global health systems, comparing and contrasting
- The role of data, information, and knowledge
- Global health challenges
- Health impacts, health outcomes, and the measurable objectives of Health interventions
- Spaces and places for care delivery
- Continuum of care & care coordination

### BUSINESS ORGANIZATION AND INFORMATION SYSTEMS

- Generic Organization of a firm (architecture, modules)
- Sectoral organization (financial, banking / insurance, government, telecom, education, health,...)
- Developing a strategy and its implementation
- Monitoring the implementation of the strategy
- Integration of different actors in the value chain (B2B, e-commerce, CRM)
- Integrating data (indicators, Business Intelligence, distribution of data)
- Apprehension of the IS environment, competitive intelligence, business intelligence

## SEMESTER 4

### INTERNSHIP

The internship with an international company will enable students to display valuable professional skills and attitudes developed during the three academic semesters. Companies usually give a stipend to the trainees.