

# Ingénierie Mathématique et Data Science

The Mathematical Engineering and Data Science Department is one of the few programs in France that graduates high-level engineers in Data Science, Digital Engineering, and Artificial Intelligence.



## L'essentiel

### Nature de la formation

### Durée de la formation

- 3 years

### Langues d'enseignement

- French

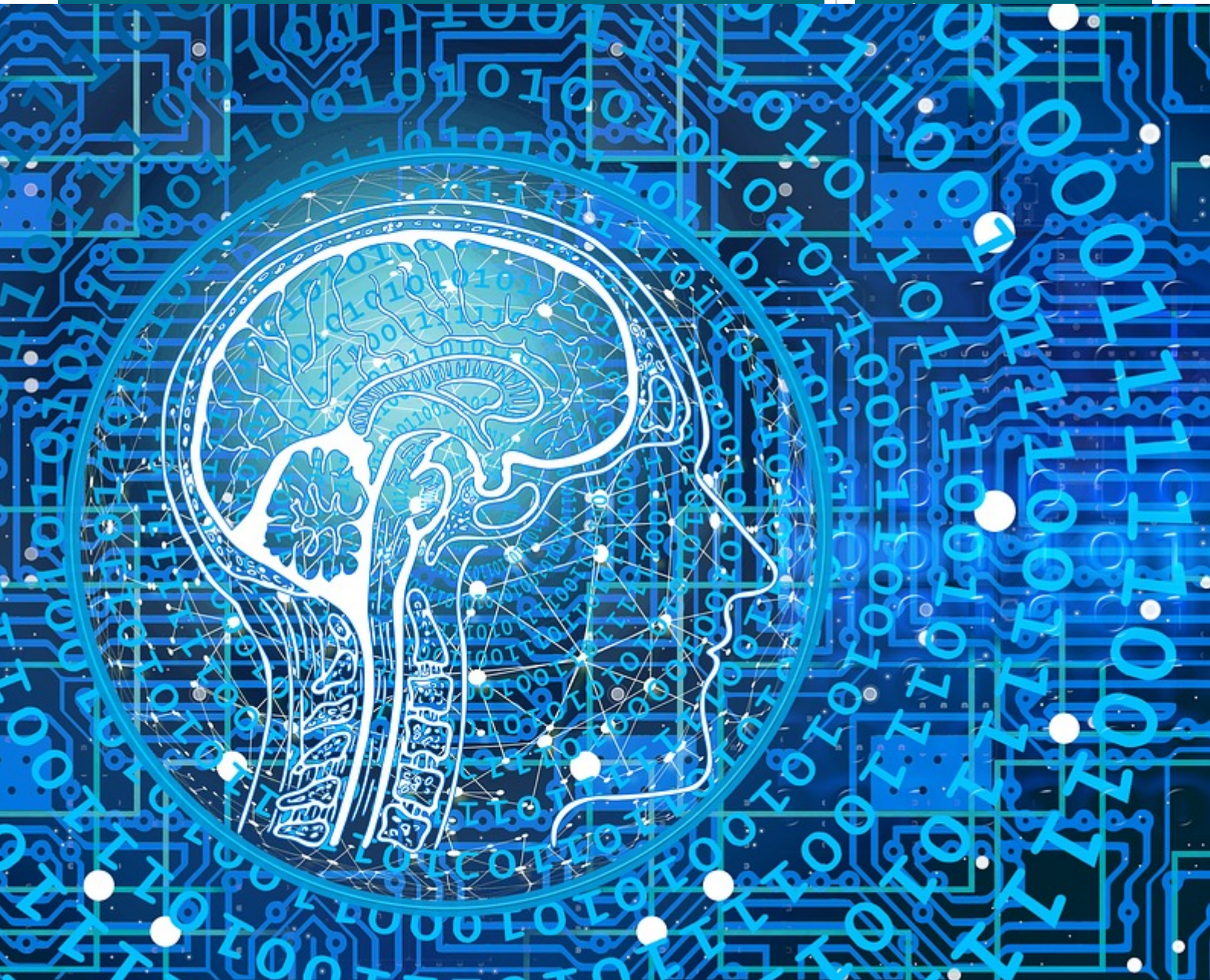
### Rythme

- Temps plein
- Temps aménagé
- En alternance
- Contrat de professionnalisation

### Modalités

- Présentiel





The **Mathematical Engineering and Data Science (IMDS)** Department trains engineers specialized in:

- 

**Data Science and Big Data**

- 

**Digital Engineering and Artificial Intelligence (AI)**

The IMDS department also offers students the opportunity to pursue a **double degree** in Mathematics (Bachelor's level) at the end of the first year of the engineering cycle. A **double Master's degree (M2)** in Mathematics or Computer Science is also available in the final year.

**Data Science** lies at the intersection of mathematics, statistics, artificial intelligence, and computer science. Its aim is to extract value from data. With the advent of **Big Data**, companies have accumulated vast amounts of information and now seek to exploit it (cleaning, aggregating, analyzing) to offer better services, solve complex problems, or make informed decisions. The demand for **Data Science engineers** is currently very high in sectors such as banking, insurance, major industrial companies, healthcare, sports, and more.

**Engineers specializing in numerical simulation** are trained to model and simulate various phenomena (e.g., climate, tire performance based on physical characteristics) using techniques from **scientific computing** (e.g., partial differential equations) and **artificial intelligence** (e.g., machine learning). Career opportunities are abundant in sectors such as energy and large industrial enterprises.

Engineers trained in our department possess diverse skills and can also work in other sectors, such as **digital services companies (ESN)**.

**Examples of internships or professional training contracts:**

- Data Science applied to predictive maintenance (**ArianeGroup**)

- Model hybridization using machine learning for connected mobility (**Michelin**)

- Implementation of a machine learning algorithm to predict plant species from satellite images (**Spheer.ai**)

- Optimization of geomechanical models using AI methods (**EPFL**)

- Creation of an AI model to predict corn yield (**Bayer**)

- Generative AI models for tire sculpture design (**Michelin**)

- Machine learning models to predict plant fertility from genotype data (**KWS**)

- Development of algorithms for football analysis using tracking and event data (**Clermont Foot**)

- Python development of an interface to manage tools for radar operation (**Thales**)

- Development of an AI algorithm to transcribe voice into text (**MAIF**)

[Télécharger le flyer de présentation de Ingénierie Mathématique et Data Science](#)



RIE  
IQUE  
ENCE

40

ingénieurs

100%

élèves-ingénieurs

ingénieurs  
diplômés  
par an

diplômés avec une  
expérience  
internationale

# INGÉNIERIEZ L'AVENTURE

Département IMDS  
des ingénieurs  
capables  
modéliser ou de  
traiter des données ou des  
problèmes à l'aide de  
techniques issues de  
l'intelligence artificielle, des  
mathématiques et du calcul  
pour répondre aux  
défis de la transformation  
numérique de la société.

## ENSEIGNEMENTS

### MATHÉMATIQUES

#### SCIENCES DES DONNÉES

*Machine Learning*

*Big Data*

*Apprentissage statistique*

*Modèles mixtes et plan d'expérience*

### SIMULATION NUMÉRIQUE

*Intelligence Artificielle*

*Calcul scientifique*

*Modélisation*

*Deep learning*

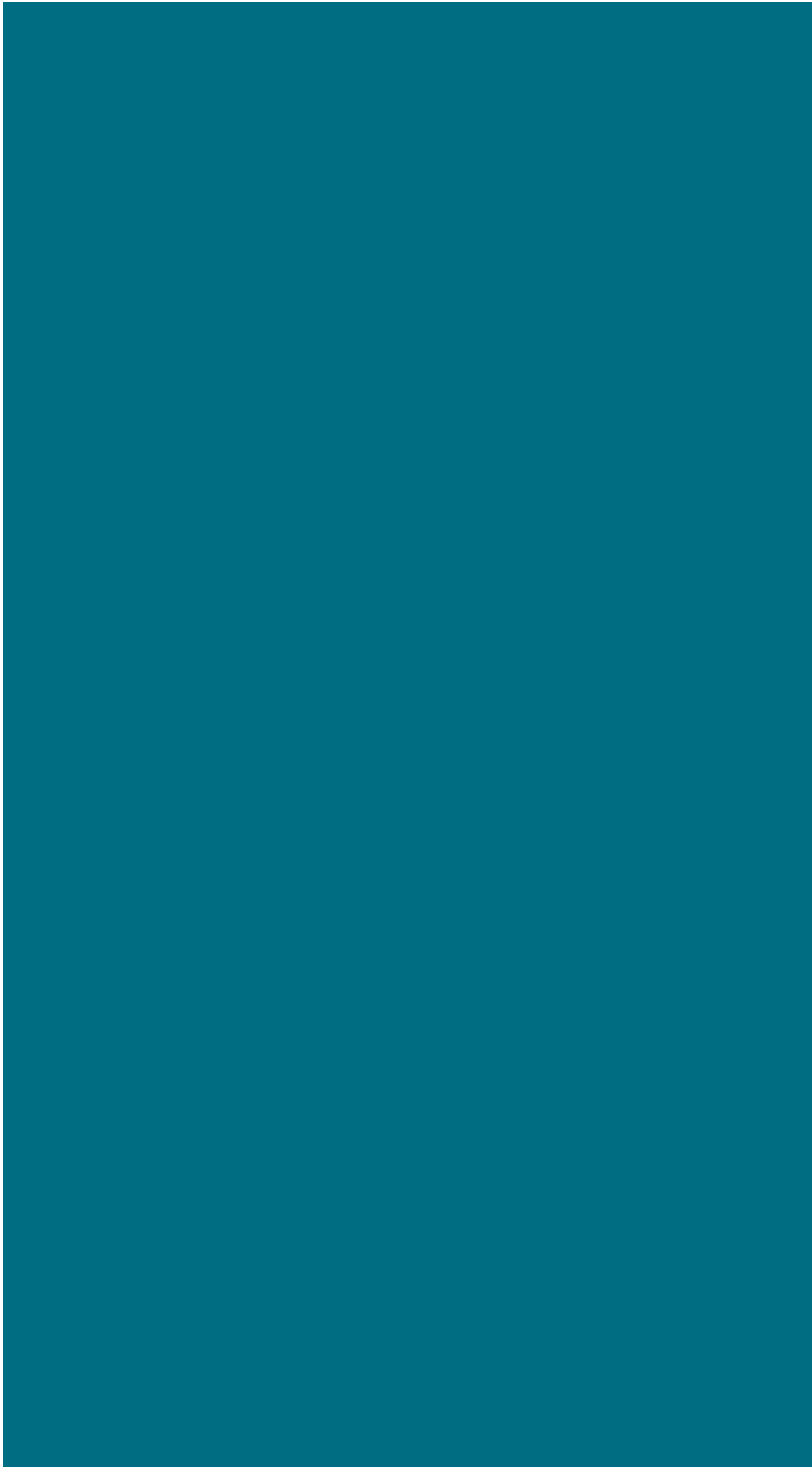
### INFORMATIQUE

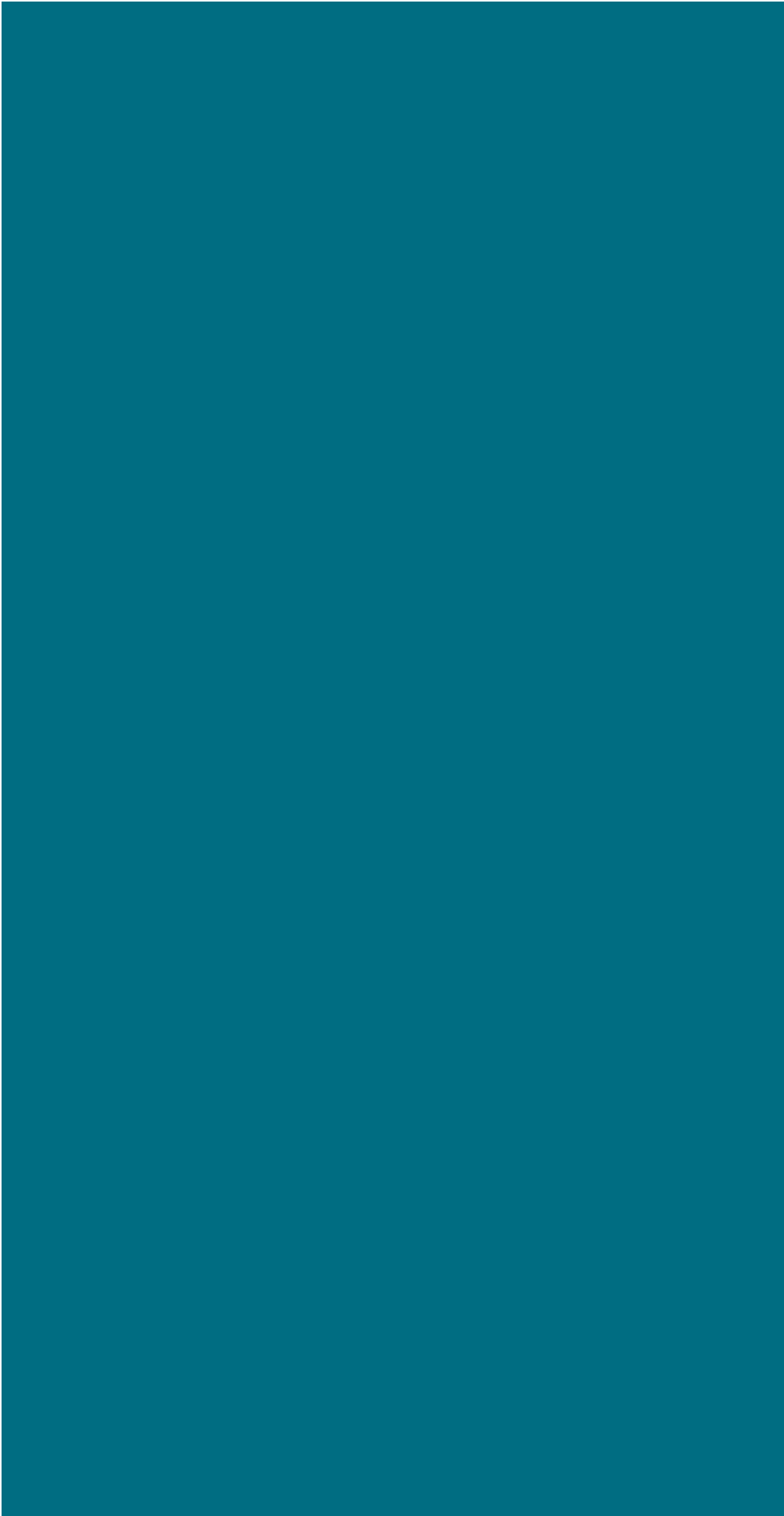
*Algorithmique*

*Génie logiciel*

*Programmation orientée objet*









ON

INGÉNIEUR

INGÉNIEUR

BAC +5

INGÉNIEUR

BAC +4

INGÉNIEUR

BAC +3



CPGE

BAC +2

CPGE

BAC +1

## PARCOURS

IMDS 5ème année

INTELLIGENCE ARTIFICIELLE

BIG DATA

APPRENTISSAGE STATISTIQUE

CALCUL SCIENTIFIQUE

BIO STATISTIQUE

TRONC COMMUN\*

IMDS  
3ème  
année

IMDS  
4ème  
année

- \* 2 modules au choix parmi les 5
- \* Cours dispensés par des professeurs du monde industriel

## UNE OUVERTURE VERS

L'ENTREPRISE

3

3ème année

COURS

4ème année

COURS

PROJET

STAGE

(min 5)

5ème année

COURS

PROJET

STAGE (min 5)

Possibilité de CONTRAT PRO

2

DOUBLES DIPLÔMES  
MASTER DE MANAGEMENT

N RAPIDE

0 € \*

RUT MOYEN  
ÔMÉS

s et avantages

tivités

URANCES

ROUPES

QUE

S & DU NUMÉRIQUE

ist  
st  
eer  
numérique  
ement informatique  
ce Artificielle

## L'INTERNATIONAL

5 DOUBLES DIPLÔMES  
MASTER OF SCIENCE

avec des universités partenaires : Canada,  
USA, Suède, Tunisie, Suisse

## LA RECHERCHE

2

RE



PROGRAMME  
INFOS PRATI  
MODALIT  
D'ADMISS



## POLYTECH Clermont

Campus universitaire des Cézeaux  
2 av. Blaise Pascal 63178 AUBIÈRE cedex  
Arrêt TRAM : Cézeaux / Pellez

[www.polytech-clermont.fr](http://www.polytech-clermont.fr)

SUIVEZ NOUS SUR LES RÉSEAUX SOCIAUX



Campus universitaire des Cézeaux - 2 av. Blaise Pascal 63178 AUBIÈRE cedex - Imprimé par PRINT CONSEIL sur papier recyclé - La voie publique - Crédits photos : Polytech Clermont, Freepik, Canva, Dcstudio, Pressfoto, Frimufilms, Prostooleh,

### IMDS Graduate Testimonials:

“A dynamic school with quality teaching and a fulfilling student life.”

— *Clément, Class of 2022*

“Great courses, a good working atmosphere, and lots of extracurricular activities — plus, life in Clermont is really enjoyable.”

— *Julie, Class of 2022*

“Skilled, dedicated, and supportive professors who care about everyone’s success, small class sizes, and a pleasant campus.”

— *Guillaume, Class of 2021*

“The quality and human values of the teaching staff.”

— *Nicolas, Class of 2021*

### The truth about Clermont-Ferrand:

<https://www.youtube.com/watch?v=zxdsBM5-n7Q>

#### Partnership:

The Class of 2022–2025 is sponsored by Akkodis.



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The Class of 2023–2026 is sponsored by Clermont Foot 63.





# CLERMONT



## Admission

### Pré-requis

#### Formation(s) requise(s)

The Mathematical Engineering and Data Science program recruits students for the engineering cycle from:

- 

Preparatory classes (CPGE): MP, MPI, PC, PSI

- 

Students from the Polytech PeiP preparatory cycle

- 

Students with a university background (L2, L3)

- 

Other applicants with a 2- or 3-year degree whose profile matches the program requirements

### Candidature

#### Modalités de candidature

[En savoir plus sur les modalités de candidature](#)

## Programme



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Les informations ci-dessous sont données à titre indicatif et peuvent faire l'objet de mises à jour.

Semestre 5		ECTS (crédits)	Se
Enseignements		30	Ens
Sciences fondamentales 1	<ul style="list-style-type: none"> <li>• Mathématiques</li> <li>• Statistiques</li> <li>• Probabilités</li> <li>• Analyse</li> <li>• Calcul numérique</li> </ul>	14	Scien fond
Sciences Technologiques, Information et Ingénierie 1 (ST2I 1)	<ul style="list-style-type: none"> <li>• Algorithmique</li> <li>• Programmation</li> </ul>	9	Scien Tech Infor Ingén
Sciences homme et société (SHS 1)	<ul style="list-style-type: none"> <li>• Communication • Anglais</li> <li>• Droit • Économie</li> </ul>	7	Scien et so

**STAGE OUVRIER - 1**

## Semestre 7

### Enseignements

#### Sciences fondamentales

- Mathématiques • Statistiques • Calcul scientifique
- Machine Learning • Deep Learning • Équation aux dérivées

#### Sciences Technologiques, Information et Ingénierie (ST2I)

- UML • C++
- Java • Python
- Bases de données avancées

#### Sciences homme et société (SHS)

- Anglais • Gestion • Droit • Communication • Organisation
- Management • Projets avec des entreprises de la Data Science

## Semestre 8

### STAGE ASSISTANT INGÉNIEUR À L'INTERNATIONAL



## Semestre 9

### Enseignements

Plusieurs matières  
au choix parmi  
les suivantes :

- Deep Learning approfondi
- Transfert Learning appliqué à la vision artificielle
- Intelligence artificielle au service de l'optimisation
- Deep Learning appliqué à la finance

- Big Data
- Réduction de la consommation d'énergie
- Apprentissage automatique
- Modèles de données

PolyCompétences (1 au choix)

- Entrepreneuriat • Management
- Contrat de professionnalisation

## Semestre 10

STAGE INGÉNIEUR (5 mois) ou CONTRAT DE PROFESSIONNALISATION

### Professional Training Contract (Contrat de professionnalisation)

Professional training contracts are available to engineering students in their final year.

Students in the initial training pathway change status and become **employees** of the host company. The duration of the professional training contract is **12 months**.

### A Win-Win Approach

For the student, the goal of the professional training contract is to **gain professional qualifications** while validating their **engineering degree**. Beneficiaries receive a **percentage of the minimum wage (SMIC)** based on their age and education level. For details on compensation, please refer to the official website of the French Ministry of Labor.

For the company, the contract allows access to an engineer who is **immediately operational** and trained in-house. In some cases, this type of contract also grants **exemptions from employer social security contributions**, within specific legal limits.

### Eligibility

The professional training contract is intended for:

- 

**Polytech Clermont students** in the initial training pathway, **aged 16 to 25**, and **admitted to the final year** of the engineering cycle;

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**All employers** subject to the professional training tax, **except** for the French government, local authorities, and their public administrative institutions.

Students with disabilities who wish to sign a professional training contract are supported through dedicated assistance programs. See available support [HERE].

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## Assessment Methods

This track includes:

- 

Two intermediate oral evaluations,

- 

A final report,

- 

A final oral defense.

In addition, students must complete **all ongoing assessments** organized by faculty throughout the year.

**Partial validation** of individual skill blocks is **not permitted**.

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## Funding

Training costs, including academic registration and tuition fees at Polytech Clermont, are **covered by the host company**. Part or all of the cost may be funded by the company's relevant **Skills Operator (OPCO)**.

## Et après ?

### Débouchés professionnels

Secteurs d'activité

- **Finance sector (banking, insurance):** decision support
- **Healthcare sector:** planning and statistical analysis of clinical trials, epidemiology, decision-making support
- **Sports sector:** match analysis, player performance studies
- **Retail sector:** quantitative market research, consumer behavior analysis
- **Large industrial companies:** R&D in artificial intelligence and scientific computing
- **IT sector:** software development, databases, information systems

## Insertion professionnelle

Average salary including bonuses (Class of 2022 graduates): €38,950/year