

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.



UNIVERSITÉ
Clermont Auvergne

L'essentiel

Nature de la formation

1

Durée de la formation

- 3 years

Langues d'enseignement

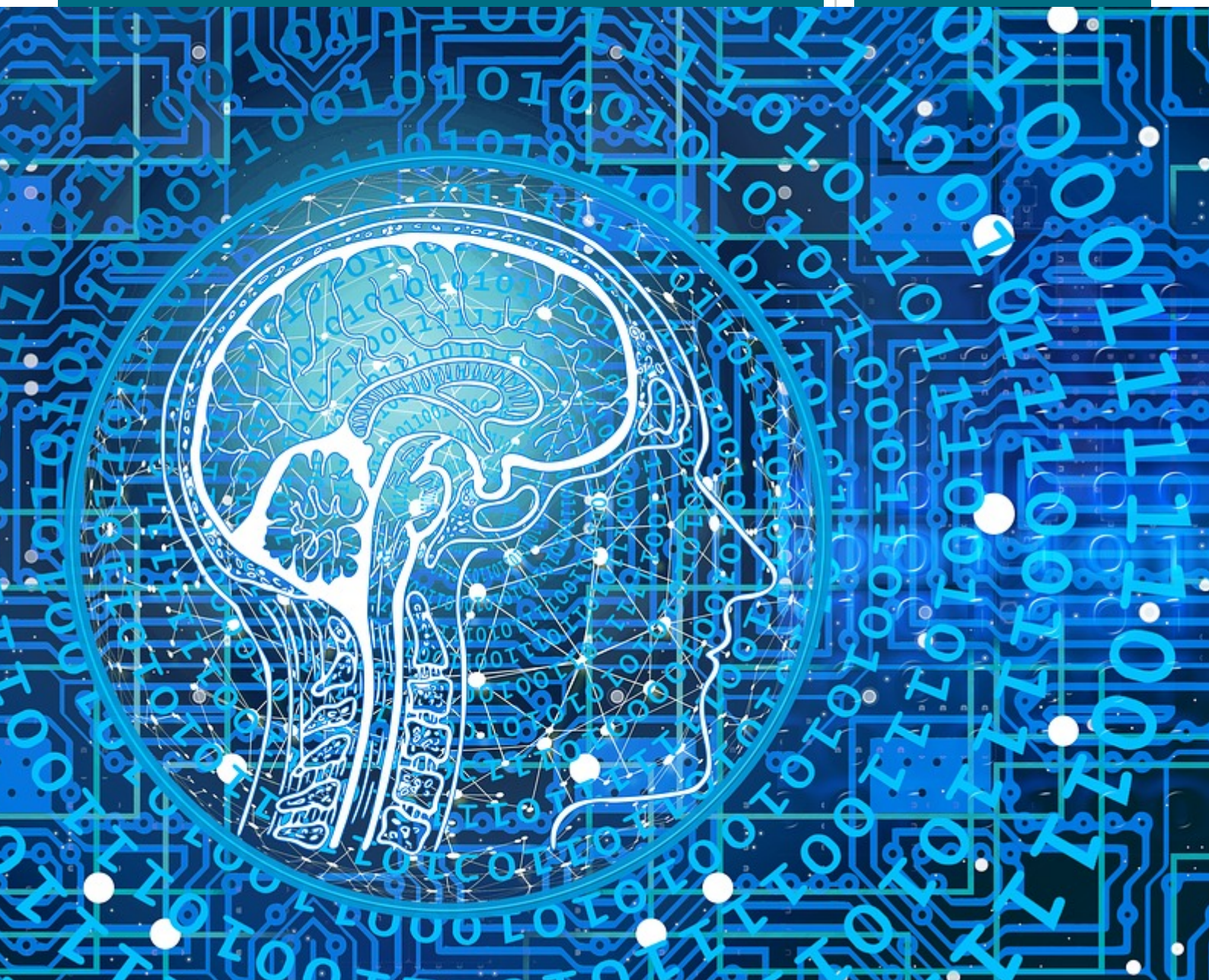
- French

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
données ou des
à l'aide de
issues de
artificielle, des
du calcul
répondre aux
transformation
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

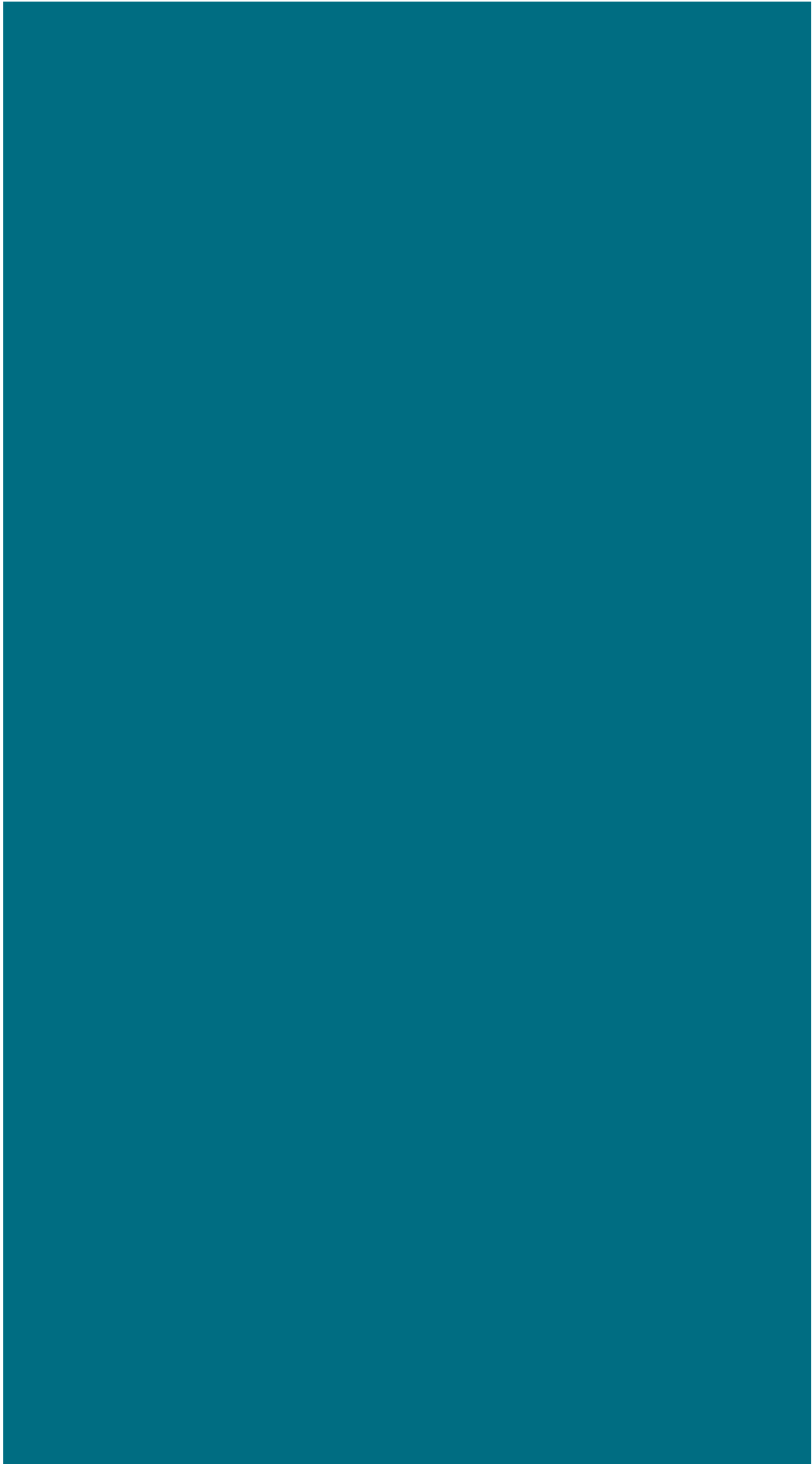
INFORMATIQUE

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

5ème année

COURS

PROJET

STAGE (min 5 mois)

Possibilité de CONTRAT PRO

2

DOUBLES DIPLÔMES
MASTER DE MANAGEMENT

N RAPIDE

0 € *

UT MOYEN
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tivités

URANCES

ROUPES

QUE

S & DU NUMÉRIQUE

ist
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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

SUIVEZ NOUS SUR LES RÉSEAUX SOCIAUX



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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.

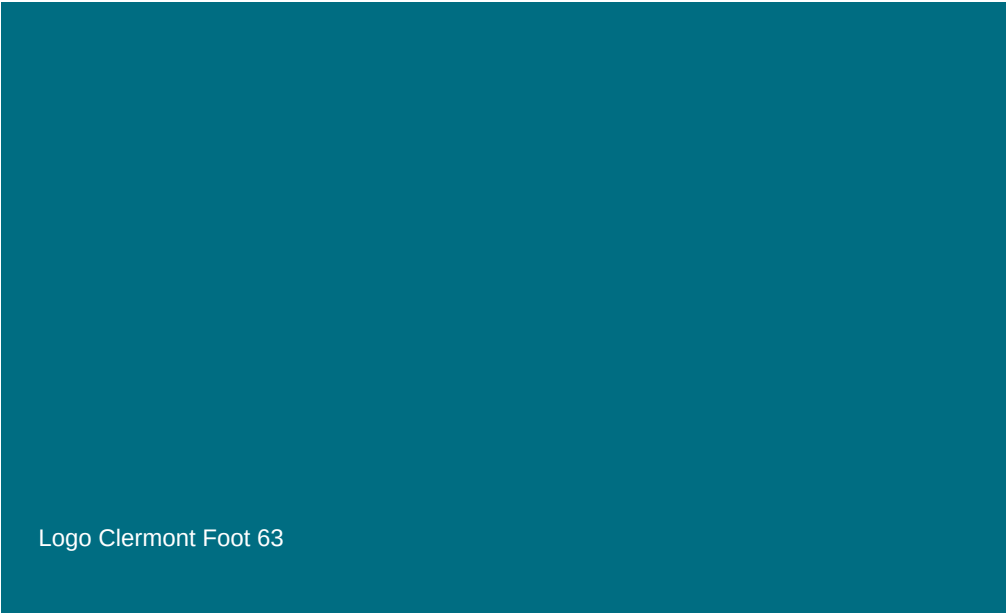


The Class of 2023–2026 is sponsored by Clermont Foot 63.



CLERM





Logo Clermont Foot 63

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

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	• Mathématiques • Statistiques • Probabilités • Analyse • Calcul numérique	14	Scien fond
Sciences Technologiques, Information et Ingénierie 1 (ST2I 1)	• Algorithmique • Programmation	9	Scien Tech Infor Ingén
Sciences homme et société (SHS 1)	• Communication • Anglais • Droit • Économie	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;



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].

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**.

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