



MASTER ACSYON

Applied Mathematics & Optimization training path

Level	Program duration	Credits
Master	2 years	120 credits

Program outline

Training in mathematical optimization applied to data science and artificial intelligence. This two-year training is provided at the University of Limoges, and is supported by the two research teams MOD and CF of the XLIM Laboratory in Limoges.

This master's degree aims to prepare for careers as an engineer or researcher in the following fields: optimization, symbolic-numerical calculation, mathematical methods for automation, shape optimization and optimal control.

Admissions requirements

Must hold a Bachelor's degree in applied mathematics or equivalent.

Organization

- Internship in M1 (international mobility)
- End-of-study internship in M2
- Scientific project in M2

How to apply

Students residing in France or the EU: www.monmaster.gouv.fr

International students from outside the EU:
www.campusfrance.org/fr

Key info

- Selective course (limited places)
- No repetition possible in TACTIC course
- Scholarships 6000€ (4000€ in M1, 2000€ in M2)
- Financial assistance for incoming and outgoing mobility

Study place

Campus La Borie, Limoges

Program contact

M1 :
francois.arnault@unilim.fr

M2 :
francisco.silva@unilim.fr

Project manager :
celine.parvy@unilim.fr

School contact

msscience@unilim.fr



What's next ?

- **Continuation of study**

Continuation in thesis possible.

- **Job opportunities**

Jobs: R&D engineer, consultant, researcher, assistant professor...

Sectors: Economic & industrial sectors: aeronautics, automobile manufacturing, telecommunications, robotics, chemistry, production technologies, imaging, large companies.

Program

Semester 1

Course name	Course unit (UE or component)	Nbr h Lecture	Nbr h Tutorial	Nbr h Practice	Credits
Applied linear algebra	UE	12h	18h	0h	3
Optimization basics	UE	12h	18h	0h	3
Practical optimization	UE	12h	9h	9h	3
Convex analysis	UE	12h	18h	0h	3
Artificial intelligence	UE	9h	9h	12h	3
Introduction to machine learning	UE	12h	9h	9h	3
Programming and algorithmics	UE	30h	0h	30h	6
Soft skills	UE	20h	10h	0h	3
Laboratory research project at XLIM	Project				3

Semester 2

Course name	Course unit (UE or component)	Nbr h Lecture	Nbr h Tutorial	Nbr h Practice	Credits
Scientific computation and parallelization	UE	9h	0h	21h	3
Stochastic processes	UE	12h	18h	0h	3
Game theory	UE	9h	9h	12h	3
Linear and quadratic programming	UE	12h	9h	9h	3
Machine learning with Python and Tensorflow	UE	12h	9h	9h	3
Artificial intelligence	UE	9h	9h	12h	3
Langue (anglais ou français)	UE	0h	30h	0h	3
Soft skills	UE	20h	10h	0h	3
Laboratory research project at XLIM	Projet				3
Abroad internship	Internship				3

Semester 3

Course name	Course unit (UE or component)	Nbr h Lecture	Nbr h Tutorial	Nbr h Practice	Credits
Spitting methods for convex optimization	UE	12h	9h	9h	4
Deep learning	UE	12h	9h	9h	4
Topics in numerical optimization and game theory	UE	12h	18h	0h	4
Topics in machine and	UE	12h	18h	0h	3

deep learning theories					
Fast algorithmic methods for optimization and learning	UE	12h	9h	9h	4
Reinforcement learning and stochastic optimization	UE	12h	9h	9h	4
Applied multilinear algebra	UE	12h	18h	0h	4
Language (English or French)	UE	0h	30h	0h	3

Semester 4

Course name	Course unit (UE or component)	Nbr h Lecture	Nbr h Tutorial	Nbr h Practice	Credits
Research or entrepreneurial project	Project				6
End of study internship (master's thesis)	Internship				24