Master 1 / Master 2

SCIENTIFIC COMPUTING

Mention

Mathematics and applications

APPLICATIONS

Prerequisites for access to Master 1: Bachelor-level knowledge in mathematics.

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https://ecandidat.univ-lille.fr/

RECRUITMENT CALENDAR

- Opening: May 4, 2020 - June 12, 2020
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INTERNATIONAL RELATIONSHIPS

- The University of Lille has a policy of supporting international access to its courses. That’s why it has introduced special procedures to make international students feel welcome and form collaborations.
- Practical information for your stay at the University of Lille:
https://www.univ-lille.fr/home/international-student/

UNIVERSITY OF LILLE

European benchmark university, recognized for the excellence of its lifelong training, the University of Lille is setting up at the beginning of the 2020 academic year a renewed training offer in its diplomas, programs and teaching methods which places the student at the heart of his/her concerns, to encourage his/her involvement and success. It offers 195 training mentions in line with changes in the socio-economic world, backed by cutting-edge international research conducted by 62 research units in order to raise the major challenges of these societies.

FACULTY OF SCIENCE AND TECHNOLOGY

The faculty of science and technology is a training and research unit of the University of Lille.

It brings 37 training departments and 27 research structures in the following areas:
- Biology
- Chemistry
- Electronics, Electrics engineering, Automatic
- Computer Science
- Mathematics
- Mechanics
- Physics
- Earth Science
- Station Marine Wimereux.

The faculty of science and technology of the University of Lille offers a multidisciplinary training offer quality, from Bachelor to PhD, through professional bachelors and master’s degrees. The faculty hosts every year on the campus more than 7 000 students in initial training.

COORDINATORS AND DIRECTORS

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ADMINISTRATIVE STAFF

Faculty of Sciences and technology
Mathematics Department
- University of Lille - Campus cité scientifique
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This Master offers a high-level training in high performance computing for numerical simulation. Students who have validated this degree have:
- for 2/3, found a job as an engineer or research engineer in a company or an applied research center;
- for 1/3, improved and completed their skills in scientific computing, preparing a PhD thesis.

The objective of the Master degree is to train scientists able to understand the models from physics and industry, to create and implement simulation methods for these models in an optimal way on the most recent parallel computer architectures.

The training provides:
- knowledge of mathematical modeling of physical phenomena;
- a mastery of universal mathematical and computer tools (optimization, signal processing, programming);
- an expertise in simulation of the physic’s equations physics (partial differential equations): efficient numerical schemes and methods;
- an expertise in programming languages and supercomputing: parallel computing, accelerator (GPU) programming, distributed computing.

The teaching team is composed of (associate) Professors from 5 joint research units of the Faculty of Science and Technology as well as invited speakers from the economic world.

The training is organized around Knowledge and Skills Blocks (BCC).

**OB jECTIVES**

T aught in French:

**MASTER 1 AND MASTER 2: MATHEMATICS AND APPLICATIONS**

cursus Scientific computing

**TARGETED SKILLS**

The skills acquired by students are:
- general and multidisciplinary scientific culture in modeling (physics, mechanics), applied mathematics (partial differential equations, linear algebra, optimization, probabilities), in computer science languages and programming principles, in scientific english.
- an expertise: programming in applied mathematics on the handling of partial differential equations (PDEs), and methods to solve these PDEs using computers.
- the masters of programming languages adapted to scientific computing (C++, Python) and the practice of high performance computing on the most recent hardware architectures.
- the ability to apply these skills in a professional situation through a 4-to-6-months internship in a company or a research laboratory.

**STRENGTHS OF THE TRAINING**

- The major assets of this training are its multi-disciplinary nature and its coherence. The students succeed in mastering the whole process of numerical simulation: from an abstract model to a realistic simulation that makes the best use of available computing resources. This makes them valuable and rare recruits both in the private market and in research laboratories.
- There is a strong interaction between fundamental courses and practical modules, extended by numerous supervised projects concretely implementing the acquired knowledge.
- For their specialization, the master 2 students have powerful computing resources to carry out their projects the hybrid cluster from the DSI computing center of University of Lille as well as access to the Grid’5000 nation-wide computational grid.
- The teaching team is composed of (associate) Professors from 5 joint research units of the Faculty of Science and Technology as well as invited speakers from the economic world.
- Master scholarships of up to 10,000€ are awarded to the most deserving students.

**STUDIES**

About 1/3 of the master’s students continue with a PhD thesis. It is possible under certain conditions (access through application). The 3-year doctorate is possible under certain conditions (access through application). The 3-year doctorate is possible under certain conditions (access through application).

**JOBS OPPORTUNITIES & FURTHER STUDIES**

**CLOSED TO...**

- The University of Lille is a research center of excellence, a place of cutting-edge research.
- The Laboratory for Scientific Computing is an internationally renowned laboratory.
- The Laboratory for Scientific Computing is recognized as one of the European excellence centers in scientific computing.

The training is part of the Graduate Program « Science and technology for an information and knowledge society », a multidisciplinary program of the challenge « Human-friendly digital Worlds ». Nvidia, Intel, Atos-Bull, IBM or other national companies regularly intervene in training through a seminar or a training day.

Master 1 courses are taught in English, Master 2 courses are taught in English. The recommended level of English corresponds to level B2 of the Common European Framework of Reference. The training is organized around Knowledge and Skills Blocks (BCC).

**TRAINING ORGANIZATION**

Taught in English:

**MASTER 1 AND MASTER 2: MATHEMATICS AND APPLICATIONS**

cursus Scientific computing

**STRENGTHS OF THE TRAINING**

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- The teaching team is composed of (associate) Professors from 5 joint research units of the Faculty of Science and Technology as well as invited speakers from the economic world.

For more information on the national diplomas offered by the Faculty of science and technology of the University of Lille, consult the training catalog:
www.univ-lille.fr/formations.html