

SINF2M1

2013 - 2014

Master [60] in Computer Science

At Louvain-la-Neuve - 60 credits - 1 year - Day schedule - In englishDissertation/Graduation Project : **YES** - Internship : **NO**Activities in English: **YES** - Activities in other languages : **NO**Activities on other sites : **NO**Main study domain : **Sciences**Organized by: **Ecole Polytechnique de Louvain (EPL)**Programme code: **sinf2m1** - European Qualifications Framework (EQF): 7**Table of contents**

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SINF2M1 - Introduction

Introduction

The Master aims to train professionals who will be able to understand and analyze the complex needs of customers , designing computer systems to meet these needs , master technologies in this rapidly changing field to achieve the designed solutions, to ensure the quality of products and of development processes .

Your profile

This master is designed for students for whom the master 120 seems too heavy.

With the preparatory year , it offers an opportunity to complete their training at university and 2 years to get a master's degree for High Schools students (from Belgium) who already have a bachelor's degree in the field .

You

- aspire to **imagine, design, implement and deploy** the computer applications that will shape our future;
- have a bachelor degree with a specialization in computer science;
- want to improve your **theoretical knowledge** and develop your **practical skills** in disciplines such as artificial intelligence, computer networks, information security, software engineering and programming systems;
- would like to build up **soft skills** such as foreign languages, management of resources, team work and communication, work discipline and ethics.

Your future job

We train

- **professionals** who will design computer systems which encounter customer needs;
- **innovators** who master a broad range of technologies and their continuous evolution;
- **specialists** able to implement software solutions with a particular attention to quality of the product and of its development process.

Your programme

The master includes

- a **mandatory part**, to acquire the skills necessary to model, design of complex applications. The topics covered are artificial intelligence , computer networks , software engineering , compilers and databases .
- **opening to other disciplines** through a course on Human Resource Management and an elective course (as the UCL is a wide university , many opportunities are offered);
- a **master's thesis** that offers the possibility of treating a subject in depth and its magnitude is a true introduction to professional life as a computer scientist, the subject of this work is chosen in consultation between you, the program committee and optionally an industry.

SINF2M1 - Admission

For the specific conditions of this program : refer to the French version

General and specific admission requirements for this program must be satisfied at the time of enrolling at the university..

SINF2M1 - Information

Learning outcomes

Master 60 credits in computer science aims to train professionals who will be able to understand and analyze the complex needs of customers, to design computer systems that meet these needs, to master technologies in this quickly evolving field, achieve the designed solutions, to ensure the quality of products and development processes.

Beyond the mere acquisition of knowledge, training is based on a **deep understanding of concepts, reflection and abstraction**. This theoretical approach is complemented by the **application of concepts** which takes an important place in training. Thus, the program includes many projects and practical works.

The program are taught in **English** (rare exceptions are specified in the detailed program). This gives students the opportunity to practice speaking English intensively during their training.

On successful completion of this programme, each student is able to : demonstrate mastery of a solid body of knowledge in computer science, enable him to solve problems within its discipline.

The master's program develops advanced skills in the computer science field. Various areas are addressed in the core curriculum:

- networks and distributed systems;
- programming languages;
- software engineering;
- artificial intelligence.

organize and carry out every step of the software development process, meeting the generally complex needs of a customer

1. **analyze** the problem or functional requirements, to meet and formulate the corresponding **specification**.
2. **model** the problem and **design** one or more original technical solutions that meet these specifications.
3. **assess and classify** solutions in terms of the criteria expressed in the specifications: effectiveness, feasibility, quality, ergonomics and safety to the environment.
4. implement and test the solution.
5. make **recommendations** to improve the **operational features** of the solution.

contribute in a team, to plan and bring a project to completion, taking into account the objectives, resources and other constraints

1. set and explain the **objectives of a project** (involving performance indicators) in the light of the challenges and constraints that characterize the project environment.
2. **engage collectively** on a work plan, timeline and roles of each team member.
3. operate in a **multidisciplinary environment**, together with colleagues carrying **different perspectives**, thus managing disagreements or conflicts.
4. **make decisions as a team** when choices are to be made, whether on technical solutions or work organization

communicate, both orally and in writing to carry out the projects entrusted to him in his work environment, and improve its foreign language skills (e.g. French and English)

1. clearly identify the needs of the **customer** or user: **ask questions, listen and understand** all aspects of the request and **not just the technical aspects**.
2. argue and convince, adapting the **language to suit the potential audience**: technicians, colleagues, clients, superiors.
3. use and interpret **graphics and diagrams** as an efficient communication medium to present results or to structure information.
4. read, analyze and **use technical documents** (standards, diagrams, user's guides, specifications ...).
5. **prepare written documents taking** into account the **contextual requirements** and social conventions in this field.
6. make **persuasive oral presentations** using modern communication techniques

demonstrate both rigor, openness, critical thinking and ethics in his work.

1. apply the **standards** in their discipline (terminology, units of measurement, standards of quality and safety ...).
2. find solutions that go **beyond purely technical issues**, integrating sustainable development issues and the ethical dimension of a project.
3. demonstrate **critical thinking** regarding a technical solution to verify its robustness and minimize its risks in relation to the context of its implementation.
4. **self-assess and individually develop knowledge** to remain competent in his field.

Teaching method

Active learning and soft skills

You will play an active role in your training. The pedagogical approach is a well-balanced mix of lectures, exercises, projects to be carried alone or in a group. The teaching methods vary. At times, you will be led to discover the concepts and techniques independently, the teaching team is then seen as a resource rather at your disposal to support your learning. At other times, teaching is more transmissive and provides the necessary keys to perform later practical tasks.

An important place is reserved for non-technical skills (autonomy, organizational skills, time management, communication, etc.). In particular, by putting an emphasis on project activities (including a large-scale project putting the students in a semi-professional situation), the pedagogical approach develops in the students a critical mind capable of designing, modelling, implementing, maintaining and validating complex computing systems.

Foreign languages

Globalisation imposes on any society to open its doors towards foreign markets. Moreover, English is by far the most commonly used language in computer science. The use of English during the entire curriculum allows students to develop their mastery of the English language, which will ease their integration in foreign universities and companies. All course material and supervision are in English but the student can always ask questions or answer his exams in French if desired.

Moreover, the programme allows for attending language courses at the university's Language Institute ([ILV](#)) and for taking part in foreign exchange programmes.

Evaluation

The learning activities are assessed according to the rules of the University (see [exam regulations](#)), that is through written and oral exams, personal or group assignments, public presentation of projects and defence of the graduation thesis. For the courses given in English, questions will be expressed in English by the teacher, but the student may choose to answer in French. For the courses given in French, the questions will be expressed in French by the teacher, but the student may ask for help in translation and choose to answer in English.

Some activities such as projects during the semester under the supervision of the teaching staff and in collaboration with other students are not reorganized outside the period prescribed for the course. They are not re-evaluated at a later session.

Evaluation methods specific to each course are communicated to students by teachers at the beginning of the semester.

Mobility and/or Internationalisation outlook

International possibilities (for UCL students)

This master's program is only 60 credits. Therefore, there is no place left for mobility. Students interested in this kind of enriching experience are invited to consider the master 120-credits in computer science.

However as the program is taught in English, it immediately opens up international career perspectives.

International appeal (for non-residents)

The program is taught in English and can be followed without any prior knowledge of French. With few exceptions, all courses are taught in English. For non-French speaking students, substitution to French courses will be offered by the program committee depending on the curriculum of the student.

Possible trainings at the end of the programme

Masters - 120 credits available :

The master 60-credits in computer science can be pursued by a Master 120-credits in computer science. However, this path is not ideal because maximum 37 credits of the 60 credits can be reused in the Master 120-credits.

SINF2M1 - Contacts

Curriculum Managment

Entite de la structure INFO

Acronyme	INFO
Dénomination	Commission de programme - Sciences informatiques et ingénieur civil en informatique
Adresse	Place Sainte Barbe, 2 bte L5.02.01 1348 Louvain-la-Neuve Tél 010 47 31 50 - Fax 010 45 03 45
Secteur	Secteur des sciences et technologies (SST)
Faculté	Ecole Polytechnique de Louvain (EPL)
Commission de programme	Commission de programme - Sciences informatiques et ingénieur civil en informatique (INFO)

Academic Supervisor : [Kim MENS](#)

Jury

Président du Jury : **Piotr SOBIESKI**

Secrétaire du Jury : **Marc LOBELLE**

Usefull Contacts

Conseillère aux études : **Chantal PONCIN**

SINF2M1 - Detailed programme

Programme structure

The program of each student will reach a minimum of 60 credits spread over an academic year (spreading over 2 years is possible under certain conditions) with a **core curriculum** (55 credits) and **electives** (5 credits). The program can be adapted according to the previous background of the candidate. In any case, the program of each student will be subject to the approval of the program committee.

The program is available in **English**. For non French speaking students, substitution to compulsory courses in French will be offered by the program committee. In particular, for students who don't have a bachelor degree from UCL, the religious sciences course can be replaced by a complementary activity to memory under the heading FSA2993.

Core study

> [Tronc commun du master 60 en sciences informatiques](#) [en-prog-2013-sinf2m1-lsinf221t.html]

Programme by subject

Core courses

○ Mandatory

△ Courses not taught during 2013-2014

⊕ Periodic courses taught during 2013-2014

⊗ Optional

⊖ Periodic courses not taught during 2013-2014

‡ Two years course

Click on the course title to see detailed informations (objectives, methods, evaluation...)

○ Cours d'informatique de base de la spécialisation.

○ LINGI2132	Languages and translators	Pierre Schaus	30h+30h	6 Credits	2q
○ LINGI2141	Computer networks: information transfer	Olivier Bonaventure	30h+30h	6 Credits	1q
○ LINGI2261	Artificial intelligence: representation and reasoning	Yves Deville	30h+30h	6 Credits	1q
○ LSINF2255	Software Development Project	Kim Mens	15h+45h	6 Credits	1q

○ Cours de polyvalence en sciences humaines

○ LLSMG2004	Human Resources Management	Evelyne Léonard	30h	5 Credits	
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○ Cours de systèmes d'information.

○ LINGI2172	Databases	Bernard Lambeau	30h+30h	6 Credits	2q
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○ Cours au choix

Cours au choix dans le porte-feuille de l'UCL avec accord de la commission de programme et pour 5 crédits au moins.

○ Religion courses for student in exact sciences

The student shall select 2 credits from amongst

The student shall select

⊗ LTECO2100	Questions of religious sciences: biblical readings	Hans Ausloos	15h	2 Credits	1q
⊗ LTECO2200	Questions of religious sciences: reflections about christian faith	Dominique Martens	15h	2 Credits	2q

⌘ LTECO2300	Questions of religious sciences: questions about ethics	Philippe Cochinaux	15h	2 Credits	1q
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o Master Thesis (18 credits)

o LSINF2991	Travail de fin d'études (60)	N.		18 Credits	
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