SINF2M1

2017 - 2018

Master [60] in Computer Science

At Louvain-la-Neuve - 60 credits - 1 year - Day schedule - In english
Dissertation/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 acronym: **sinf2m1** - Francophone Certification Framework: 7

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<center>**SINF2M1 - Introduction**</center>

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Introduction

Introduction

The objective of this Master's degree programme is to train computer science professionals capable of understanding and analysing the complex needs of a company, of designing computing systems that meet those needs, of mastering the rapidly evolving technological tools in this area, of implementing solutions, of assuring quality products and procedures in a company.

Your Profile

This Master's degree programme is particularly well-suited for students for who consider the Master's degree programme (120) too burdensome.

You would like to

- Imagine, design, and implement computer science systems that will shape the future;
- continue your education beyond the Bachelor's degree with a major in computer sciences (or the equivalent);
- improve your theoretical knowledge and develop your technical expertise in fields like artificial intelligence, computer networks, information security, software engineering and programming systems;
- improve your interdisciplinary knowledge in areas such as foreign languages, resource management, teamwork, autonomy and ethics.

Your Future Job

We train

- professionals who will design computer systems that meet users' needs;
- innovators who can master a wide range of constantly evolving technologies;
- specialists capable of implementing software solutions with particular attention paid to product quality and its development process.

Your Programme

This Master's degree programme consists of

- a core curriculum aiming to provide the knowledge and skills necessary to model and design complex applications. Topics covered include artificial intelligence, computer networking, software engineering, compilers and data bases;
- general knowledge courses such as classes in management and human resources (as a comprehensive university, UCL offers numerous general knowledge courses according to student interest);
- a graduation project that offers students the possibility to study a subject in-depth and thanks to its size, introduces students to the professional life of a computer scientist or researcher; the topic of this project is selected in consultation with the programme supervisors and possibly a company.

SINF2M1 - Teaching profile

Learning outcomes

The computer science developers and designers of tomorrow face two major challenges:

- increasingly complex computer science systems
- increasingly varied areas of application

In order to meet these challenges, future diploma holders should:

- master real computer science technologies but also keep up with their constant progress
- work as part of multidisciplinary teams that take into account non-technical issues

The future diploma holder in computer science will acquire the knowledge and skills to become:

- scientists who know how to understand and analyse the complex requirements that a computer system must meet;
- professionals who will design computer systems that meet users' needs;
- specialists capable of implementing software solutions with particular attention paid to product quality and its development process;

This Master's degree programme (60) provides an in-depth understanding of concepts and emphasises abstract thinking. This theoretical approach is complemented by the application of these concepts. The programme thus includes numerous projects and studies.

Apart from certain exceptions outlined in the detailed course programme, all courses in the programme are given in English. The mastery of this language is indispensable in the area of computer science.

On successful completion of this programme, each student is able to :

1.démontrer la maîtrise d'un solide corpus de connaissances en informatique, lui permettant de résoudre les problèmes qui relèvent de sa discipline

2.organiser et de mener à son terme une démarche de développement d'un système informatique répondant aux besoins généralement complexes d'un client

3.contribuer en équipe à la conduite d'un projet et de le mener à son terme en tenant compte des objectifs, des ressources allouées et des contraintes qui le caractérisent

4.communiquer efficacement oralement et par écrit en vue de mener à bien les projets qui lui sont confiés dans son environnment de travail (en particulier en anglais).

1.demonstrate mastery of a solid body of knowledge in computer science allowing them to solve problems raised in their field of study

This Master's degree programme aims to provide students with advanced knowledge and is based on the fundamentals of computer science acquired in the Bachelor's degree programme. A diversity of subjects are offered in the common curriculum:

- Networking;
- Programming languages;
- Software engineering;
- Artificial intelligence .

2.organise and carry out the development of a computer system that meets the complex demands of a client

2.1.Analyse a problem to solve or functional needs to be met and formulate a corresponding specifications note.
2.2.Model a problem and design one or more technical solutions in line with the specifications note.
2.3.Evaluate and classify solutions in light of all the criteria included in the specifications note: efficiency, feasibility, quality, ergonomics and environmental security.
2.4. Implement and test the chosen solution.
2.5.Come up with recommendations to improve the operational nature of the solution.

3.contribute as part of a team to the planning and completion of a project while taking into account its objectives, allocated resources, and constraints

3.1. Frame and explain the project's objectives (in terms of performance indicators) while taking into account its issues and constraints
3.2. Collaborate on a work schedule, deadlines and roles
3.3. Work in a multidisciplinary environment with peers holding different points of view; manage any resulting disagreement or conflicts
3.4. Make team decisions and assume the consequences of these decisions (whether they are about technical solutions or the division of labour to complete a project)

4.communicate effectively (orally or in writing) with the goal of carrying out assigned projects in the workplace (in English in particular)

4.1. Identify the needs of the client or the user: question, listen and understand all aspects of their request and not just the technical aspects
4.2. Present your arguments and adapt to the language of your interlocutors: technicians, colleagues, clients, superiors
4.3. Communicate through graphics and diagrams: interpret a diagram, present project results, structure information

4.4. Read and analyse different technical documents (rules, plans, specification notes)

4.5. Draft documents that take into account contextual requirements and social conventions

4.6. Make a convincing oral presentation using modern communication techniques

5.demonstrate rigor, openness and critical thinking as well as a sense of ethics in your work

5.1. Rigorously apply the standards of your discipline (terminology, measurement units, quality standards and security)

5.2. Find solutions that go beyond strictly technical issues by considering sustainable development and the socio-economic ethics of a project

5.3. Demonstrate critical awareness of a technical solution in order to verify its robustness and minimize the risks that may occur during implementation

5.4. Evaluate oneself and independently develop necessary skills to remain knowledgeable in the field

Programme structure

The Master's degree programme (60) in computer science consists of a minimum of 60 credits spread over one year (under certain conditions). It consists of a core curriculum (50 cedits) and 2 elective course (10 credits).

This programme may vary depending on students' prior course of study. If during their previous studies, students have already taken a required class or completed an equivalent activity, they may substitute this course with an activity of their choice from the Master's degree programme (120) in computer science (provided they follow the programme guidelines). They will also verify that the minimum number of required credits for their diploma has been obtained.

Such programmes will be submitted to the appropriate programme commission for approval.

The majority of courses in this programme are offered in English. For non-Francophone students, alternative courses will be suggested by the programme commission as substitutes for required courses taught in French. This will be done on a case by case basis depending on the student's curriculum.

It is always possible for students to speak in French in class or during evaluations. Specifically, the graduation thesis/project may be written and defended in either English or French.

> Core Curriculum for the Master¿s degree programme (60) in computer science   *[en-prog-2017-sinf2m1-lsinf221t.html]*

SINF2M1 Detailled programme

Programme by subject

CORE COURSES

⦿ Mandatory	⌧ Optional
△ Courses not taught during 2017-2018	⊘ Periodic courses not taught during 2017-2018
⊕ Periodic courses taught during 2017-2018	🟨 Activity with requisites

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

⦿ Specialised courses in computer science

⦿ LINGI2132	Languages and translators	Pierre Schaus	30h+30h	6 Credits	2q
⦿ LINGI2241	Architecture and performance of computer systems	Ramin Sadre	30h+30h	6 Credits	1q
⦿ LINGI2255	Software engineering project	Kim Mens	30h+30h	6 Credits	1q
⦿ LINGI2261	Artificial intelligence: representation and reasoning	Yves Deville	30h+30h	6 Credits	1q

⦿ Interdisciplinary courses in the humanities and social sciences

⦿ LFSA2210	Organisation and human resources	John Cultiaux	30h	3 Credits	2q

⦿ Courses in information systems

⦿ LINGI2172	Databases	Siegfried Nijssen	30h+30h	6 Credits	2q

⦿ Elective courses (8 credits)

En plus des 2 UE ci-dessous, l'étudiant peut prendre des cours au choix dans le porte-feuille de l'UCL avec accord de la commission de programme et pour 8 crédits au moins.

⌧ LINGI2401	Open Source strategy for software development	Lionel Dricot	30h+15h	5 Credits	1q
⌧ LINGI2402	Open Source Project			5 Credits	

⦿ Religion courses for students in natural sciences (2 credits)

For students who did their bachelor at UCL
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	Marcela Lobo Bustamante	15h	2 Credits	1q

⦿ Master Thesis (15 credits)

⦿ LSINF2991	Graduation project/End of studies project	Charles Pecheur (coord.)		15 Credits	

The programme's courses and learning outcomes

For each UCL training programme, a reference framework of learning outcomes specifies the competences expected of every graduate on completion of the programme. You can see the contribution of each teaching unit to the programme's reference framework of learning outcomes in the document "In which teaching units are the competences and learning outcomes in the programme's reference framework developed and mastered by the student?"

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SINF2M1 - Information

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Admission

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

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SUMMARY

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University Bachelors

Diploma	Special Requirements	Access	Remarks
UCLouvain Bachelors			
		Direct Access	
		Access with additional training	
Others Bachelors of the French speaking Community of Belgium			
		Direct Access	
Bachelors of the Dutch speaking Community of Belgium			
		Direct Access	
Foreign Bachelors			
		Direct Access	

Non university Bachelors

Diploma	Access	Remarks
BA en informatique de gestion - EPS - crédits supplémentaires entre 30 et 60 BA en informatique de gestion - HE - crédits supplémentaires entre 30 et 60 BA en informatique et systèmes (informatique industrielle) - EPS - crédits supplémentaires entre 30 et 60 BA en informatique et systèmes (informatique industrielle) - HE - crédits supplémentaires entre 30 et 60 BA en informatique et systèmes (réseaux et télécommunications) - EPS - crédits supplémentaires entre 30 et 60 BA en informatique et systèmes (réseaux et télécommunications) - HE - crédits supplémentaires entre 30 et 60 BA en informatique et systèmes (sécurité des systèmes) - HE - crédits supplémentaires entre 30 et 60 BA en informatique et systèmes (sécurité des systèmes) - EPS - crédits supplémentaires entre 30 et 60 BA en informatique et systèmes (technologie de l'informatique) - EPS - crédits supplémentaires entre 30 et 60 BA en informatique et systèmes (technologie de l'informatique) - HE - crédits supplémentaires entre 30 et 60	Les enseignements supplémentaires éventuels peuvent être consultés dans le module complémentaire.	Type court

Holders of a 2nd cycle University degree

Diploma	Special Requirements	Access	Remarks

"Licenciés"

Masters

Holders of a non-University 2nd cycle degree

Adults taking up their university training

> See the website <u>Valorisation des acquis de l'expérience</u> (https://uclouvain.be/fr/etudier/vae)
It is possible to gain admission to all masters courses via the validation of professional experience procedure.

Access on the file

Reminder : all Masters (apart from Advanced Masters) are also accessible on file.

Admission and Enrolment Procedures for general registration

Supplementary classes

> ***To enrol for this Masters, the student must have a good command of certain subjects. If this is not the case, they must add preparatory modules to their Master's programme.***

O Mandatory	⊠ Optional
△ Courses not taught during 2017-2018	⊘ Periodic courses not taught during 2017-2018
⊕ Periodic courses taught during 2017-2018	🟨 Activity with requisites

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

Courses for students coming from a short bachelor.These students will have to take at least 105 credits to obtain the master in computer science.

O LBIR1212	Probabilities and statistics (I)	Patrick Bogaert	30h+15h	4 Credits	1q
O LBIR1304	Probability and statistics (II)	Patrick Bogaert	22.5h+22.5h	3 Credits	1q
O LFSAB1509	Project 4 (in Computer Science)	Yves Deville Marc Lainez (compensates Yves Deville)	22.5h+22.5h	4 Credits	2q
O LINGI1101	Discrete mathematics: logical foundations of computing science	Peter Van Roy	30h+30h	5 Credits	1q
O LINGI1122	Program conception methods	Charles Pecheur	30h+30h	5 Credits	2q
O LINGI1123	Computability and complexity	Yves Deville	30h+30h	5 Credits	2q
O LINGI1131	Computer language concepts	Peter Van Roy	30h+30h	5 Credits	2q
O LINGI1341	Computer networks	Olivier Bonaventure	30h+30h	5 Credits	1q
O LSINF1121	Algorithmics and data structures	Pierre Schaus	30h+30h	5 Credits	1q
O LSINF1250	Mathematics for computer science	Marco Saerens	30h+15h	7 Credits	1q

Teaching method

Active learning and non-technical skills

You will play an active role in your training. The pedagogical approach is a well-balanced mix of lectures, exercises, and projects to be carried out alone or in a group. The teaching methods vary. Sometimes, you will discover concepts and techniques independently. At these times, the teaching team acts as a resource in the learning process. At other times, the pedagogy focuses on transmitting the knowledge necessary to complete future tasks.

Special emphasis is placed on non-technical skills (autonomy, organisation, time management, different modes of communication, etc.) In particular, by emphasising project-based activities (including a large scale project that puts students in a semi-professional situation), this programme develops students' critical thinking skills, which allows them to design, model, implement, and validate complex computing systems.

Languages

The lingua franca of computer science is English. The use of English in the programme allows students to develop their mastery of this language, which facilitates their integration into professional life. All course material and course supervision are in English. However, students may always ask or respond to exam questions in French if desired.

Moreover, the programme allows students to attend language courses at the university's Language Institute (ILV).

Evaluation

The evaluation methods comply with the regulations concerning studies and exams (https://uclouvain.be/fr/decouvrir/ rgee.html). More detailed explanation of the modalities specific to each learning unit are available on their description sheets under the heading "Learning outcomes evaluation method".

The learning activities are assessed according to the rules of the University (see exam regulations (https://uclouvain.be/en-enseignement-reglements.html)), 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 man 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 Openness (for UCL students)

This Master's degree programme (60) does not allow for Erasmus/Socrates/Mercator exchange programmes. Students interested in international exchanges are urged to enrol in the 120 credit Master's degree programme in computer science.

International attraction (for foreign students)

The entire Master's degree programme is offered in English and knowledge of French is not necessary. Except for rare exceptions, courses are given in English. For non-Francophone students, alternative courses will be suggested by the programme commission as substitutes for required courses taught in French. This will be done on a case by case basis depending on the student's curriculum.

Possible trainings at the end of the programme

The 120 credit Master's degree programmes-accessible
The 60 credit Master's degree programme in computer science may be followed by the 120 credit Master's degree programme in computer science

Contacts

Attention, you are currently reading an archived page: below contact informations were for program study 2017-2018 only. To get current contact informations please got to current program study site.

Curriculum Management

Entity

Structure entity	SST/EPL/INFO
Denomination	(INFO) (https://uclouvain.be/repertoires/entites/info)
Faculty	Louvain School of Engineering (EPL) (https://uclouvain.be/repertoires/entites/epl)
Sector	Sciences and Technology (SST) (https://uclouvain.be/repertoires/entites/sst)
Acronym	INFO
Postal address	Place Sainte Barbe 2 - bte L5.02.01
	1348 Louvain-la-Neuve
	Tel: +32 (0) 10 47 31 50 - Fax: +32 (0) 10 45 03 45

Academic supervisor: Kim Mens

Jury

• Jean-Didier Legat

Useful Contact(s)

• Chantal Poncin

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