



## SINF1BA - Introduction

### Introduction

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#### Introduction

Computer science, or more generally information and communications technology (ICT), is everywhere; everyone uses computers/ smartphones/... to communicate, work, study, play, travel, and manage. More and more activities are assisted by computers. SMEs, public services, education world, associations, leisure, in two words the world, has a growing need for computer scientists who are competent, creative and motivated. We cannot count the daily-used IT systems: Internet, mobile, social networks, robotics, home automation, e-commerce, search engines, business management, hospitals, road safety, exhibitions and management of theatres or museums, transport, energy supply and many other areas rely on IT. There will be more and more areas impacted by ICT tomorrow and more complex applications will be needed.

With the bachelor's degree in computer science, you will

- understand in depth the foundations for the design and implementation of simple computer applications;
- master the basic underlying computer technologies;
- have developed your ability for reasoning and abstraction, required to design future applications;
- master the mathematical techniques involved in such reasoning;
- get the luggage necessary for the future "master in computer science," oriented toward the development of complex software applications.

#### Your profile

You

- have a taste for problem solving;
- are pushed by a great curiosity;
- overflow of creativity and imagination;
- are a head for abstraction, analysis and synthesis;
- have a methodical mind and show rigor in your reasoning;
- are good for human contact, organization of teamwork, leadership, etc.

Following a strong mathematical option during high school and feeling an attraction to science or economics are assets.

#### Your future job

During his career, the computer scientist will flourish and evolve in one or more of the following profiles:

- The designer identifies the needs of the future user and determines the technical means useful to fulfil these needs. He is able to speak "the language" of the customer, it has a fairly broad culture to interact successfully with non-computer experts. He masters computer technology to identify the best solution. It builds a quality architecture for this solution.
- The achiever is able to translate the indications and guidelines produced by the designer in computer components. He analyses in detail some components of the architecture, he programs, tests, deploys these components into an integrated solution. His technical expertise is very sharp.
- The IT project manager takes care of the smooth running of the project; he is responsible for the completion of the tasks associated with these systems, their safety, planning their development. As the designer, it has qualities in terms of human contacts, a good general education and strong technical skills.

#### Your programme

The bachelor has a compulsory part covering different disciplines

- computer science ;
- mathematics ;
- economics, management and social sciences;
- English;
- sciences and technology.

You choose a minor to complete your training. This option allows to open your study program to domains you are interested outside the computer science or to deepen some fields closer to the mandatory part of the program (computer science or management).

Once bachelor, you will continue your training by the Master in Computer Science.

## SINF1BA - Teaching profile

### Learning outcomes

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#### General objectives

This bachelor's programme offers a general approach to computer science in the context of basic university training. The bachelor's programme leads to the title of "Bachelor of Computer Science" and upon completion of this first cycle of studies, the student will be granted access to the master's programme in Computer Science.

This university-level training in computer science prepare future specialists capable of creating and elaborating complex and efficient computing systems that satisfy the numerous and ever-increasing needs in our society. It thus trains "software creators" rather than pure programmers. More specifically, the bachelor's programme in computer science aims at the acquisition of the following technical competences and skills :

- Gaining an in-depth understanding of the basic essentials needed to design and implement simple software systems;
- Mastering the underlying foundations of computer science;
- Developing the reasoning and abstraction abilities necessary for the creation of such systems;
- Mastering the mathematical skills needed to carry out such reasoning;
- Acquisition of the knowledge and skills necessary for the future " master's in computer science" which will be orientated towards the engineering of more complex software system;
- Acquisition of a lasting 'know-how', readily adaptable to the continuously evolving field of computer science; learning how to learn.

Computer science comprises the theoretical knowledge and practical skills needed to develop and understand complex software systems. In addition to this technical and more applied knowledge, to become a professional computer scientist, the student has to develop some extra skills such as a creative ability and critical mindset. These studies also train students to become responsible young professionals, capable of apprehending the complex socio-economic world into which computing science is embedded, and to take decisions which are both technically sound and humanly responsible. The bachelor's programme in computer science thus aims at the acquisition of other competences, such as :

- Understanding the mechanisms which govern the socio-economic and/or technical environment in which a given computer system has to be deployed;
- Integration of the acquired technical competences and skills in a multidisciplinary context;
- Developing an intellectual curiosity, an analytic mind, a capacity for critical reflection, sound communication skills and the ability to organise and manage one's studies.

4. communicate effectively in French orally and in writing to carry out the projects, use cleverly technical documents in English and understand the information transmitted orally in English

- Identify the needs of the customer who has a basic computer science culture: questioning, listening and understanding the client, keeping in mind the existence of non-technical dimensions;
- Argue and convince while adapting his communication to the language of the interlocutors: colleagues, clients, superiors;
- Communicate in graphical and schematic form, interpret a diagram, present the results of a task, structuring information;



○ English Courses (7 credits)

○ LANGL1181	<a href="#">English for Computer Scientists I</a> <i>A placement test is organized at the beginning of the annual unit 1 and 2. Depending on the obtained mark,</i>
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**o Computer science training (71 credits)**

*En bloc annuel 3, l'étudiant doit choisir l'un des trois projets suivants dans son programme de 180 crédits en bachelier: LEPL1509, LEPL1511 ou LSST1001. Les projets LEPL1511 et LSST1001 sont ouverts sur candidature et après sélection uniquement.*

○ LINFO1115	Reasoning about a highly connected world: graph theory, game theory and networks 🟡	Peter Van Roy	PO [q2] [30h+30h] [5 Credits] 🌐 > French-friendly			X
○ LINFO1101	Introduction to programming	Kim Mens Siegfried Nijssen Charles Pecheur	PO [q1] [30h+30h] [5 Credits] 🌐	X		
○ LINFO1103	Introduction to algorithms	Pierre Dupont	PO [q2] [30h+30h] [5 Credits] 🌐	X		
○ LINFO1104	Programming language concepts 🟡	Peter Van Roy	PO [q2] [30h+30h] [5 Credits] 🌐		X	
○ LINFO1121	Algorithms and data structures 🟡	Pierre Schaus	PO [q1] [30h+30h] [5 Credits] 🌐			X
○ LINFO1252	Informatic Systems 🟡	Etienne Riviere	PO [q1] [30h+30h] [5 Credits] 🌐			X
○ LINFO1123	Calculability, Logic and Complexity	Yves Deville	PO [q2] [30h+30h] [5 Credits] 🌐		X	
○ LINFO1341	Computer networks	Olivier Bonaventure	PO [q2] [30h+30h] [5 Credits] 🌐			X
○ LEPL1402	Informatics 2 🟡	Sébastien Jodogne Ramin Sadre Pierre Schaus	PO [q1] [30h+30h] [5 Credits] 🌐		X	
○ LINFO1361	Artificial intelligence					

## List of available minors

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Besides the core study, students will choose:

- the Additional module in Computer Science
- or one of the minors in the list below.



## Course prerequisites

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The **table** below lists the activities (course units, or CUs) for which there are one or more prerequisites within the programme, i.e. the programme CU for which the learning outcomes must be certified and the corresponding credits awarded by the jury before registering for that CU.

These activities are also identified **in the detailed programme**: their title is followed by a yellow square.

### Prerequisites and student's annual programme

As the prerequisite is for CU registration purposes only, there are no prerequisites within a programme year. Prerequisites are defined between CUs of different years and therefore influence the order in which the student will be able to register for the programme's CUs.

In addition, when the jury validates a student's individual programme at the beginning of the year, it ensures its coherence, meaning that it may:

- require the student to combine registration in two separate CUs which it considers necessary from a pedagogical point of view.
- transform a prerequisite into a corequisite if the student is in the final year of a degree course.

For more information, please consult the [Academic Regulations and Procedures](#).

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### # Prerequisites list

**LANGL1282** "Anglais pour informaticiens II" has prerequisite(s)

**SINF1BA - 1ST ANNUAL UNIT**

- Mandatory
- ⊗ Optional
- △ Not offered in 2024-2025
- ⊖ Not offered in 2024-2025 but offered the following year
- ⊕ Offered in 2024-2025 but not the following year
- △ ⊕ Not offered in 2024-2025 or the following year
- Activity with requisites
- 🌐 Open to incoming exchange students
- 🚫🌐 Not open to incoming exchange students
- (FR) Teaching language (FR, EN, ES, NL, DE, ...)

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

**o Core study****o General and training****o Mathematics**

● LINFO1111	Analysis	Pierre-Antoine Absil François Glineur	(FR) [q1] [45h +37.5h] [7 Credits] 🌐
● LINFO1112	Algebra	Christophe Craeye Enrico Vitale	(FR) [q2] [30h +30h] [5 Credits] 🌐

### ⌘ German courses

⌘ LALLE1101	German beginner's level 1st part (0-A1)	Fanny Desterbecq (compensates Ann Rinder)	FR [q1 or q2] [45h] [2 Credits]
⌘ LALLE1102	German beginner's level 2nd part (A1 - A2)	Caroline Klein (coord.)	FR [q2] [45h] [2 Credits]

### ⌘ Spanish Courses

⌘ LESPA1101	Spanish beginner's level 1st part (0-A1)	Begona Garcia Migura Fernando Juan San Basilio Pardo Alicia Maria Tirado Fernandez (coord.)	ES [q1 or q2] [45h] [2 Credits]
⌘ LESPA1102	Spanish (beginner's level) 2nd part (A1 - A2)	Alicia Maria Tirado Fernandez (coord.)	ES [q1 or q2] [45h] [2 Credits]

### o Computer science training

En bloc annuel 3, l'étudiant doit choisir l'un des trois projets suivants dans son programme de 180 crédits en bachelier: LEPL1509, LEPL1511 ou LSST1001. Les projets LEPL1511 et LSST1001 sont ouverts sur candidature et après sélection uniquement.

o LINFO1101	Introduction to programming	Kim Mens Siegfried Nijssen Charles Pecheur	FR [q1] [30h +30h] [5 Credits]
o LINFO1103	Introduction to algorithms	Pierre Dupont	FR [q2] [30h +30h] [5 Credits]
o LINFO1002	IT projects 2	Tom Barbette	FR [q2] [30h +30h] [5 Credits]
o LINFO1001	IT projects 1		





## SINF1BA - 3RD ANNUAL UNIT

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- Mandatory
- ✂ Optional
- △ Not offered in 2024-2025
- ⊖ Not offered in 2024-2025 but offered the following year
- ⊕ Offered in 2024-2025 but not the following year
- △ ⊕ Not offered in 2024-2025 or the following year
- Activity with requisites
- 🌐 Open to incoming exchange students
- 🌐 Not open to incoming exchange students
- [FR] Teaching language (FR, EN, ES, NL, DE, ...)

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

⊗ LEPL1509	Project 4 (in informatics) 🟡	Hélène Verhaeghe	PS [q2] [30h +22.5h] [5 Credits] 🌐
⊗ LSST1001	IngénieursSud	Stéphanie Merle Jean-Pierre Raskin	PS [q1+q2] [15h +45h] [5 Credits] 🌐
⊗ LEPL1511	Project 4 (in business projects creation)	Julien Hendrickx (coord.)	PS [q2] [30h +22.5h] [5 Credits] 🌐

### o *Minor or additional module*

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*The student completes his formation with the additional module in computer sciences or a minor.  
Maximum 1 element(s)*

## SINF1BA - Information



- For any secondary school diploma **from a European Union country**, the admission request must contain the equivalence of your

## Teaching method

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A significant part of the courses in Computer Science will focus on learning techniques through problem solving. Amongst others, two integrated computer science projects will enable the students to integrate the various course topics and expose them to the problem of realizing small-scale projects (via laboratory sessions in the first year), or medium-scale projects (via a project during the second quadrimester of the third year).

## Evaluation

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***The evaluation methods comply with the [regulations concerning studies and exams](#). 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 course content and activities are evaluated in accordance with the prevailing rules of the University (see the exam regulations). Most of the courses include at least one evaluation during the course of the quadrimester (ongoing evaluation), in addition to a final examination during the exam sessions (in January, June or September). Evaluations are either in written or in oral form. The specific evaluation details and procedures for each course are presented at the start of each study period.

## Mobility and/or Internationalisation outlook

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- Secrétaire du Jury: [Cristel Pelsser](#)
- Président du Jury: [Claude Oestges](#)

Useful Contact(s)

- Secrétariat: [Cindy De Saeger](#)
- Conseillère aux études en sciences informatiques: [Cécile Lombart](#)

