SINF1BA - Introduction

Introduction

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

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.

Objectives of the foundation studies

The objective of the basic university-level studies is to allow the student to acquire essential competences and skills in the areas of computer science, mathematics, science and technology, economics and management, human sciences and English.

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

1. demonstrate a solid basic knowledge of computer science, which, being supplemented by a solid education in other areas, allows him to solve problems within his discipline

The bachelor’s program aims the acquisition of knowledge in :

- Discrete structures;
- Programming Fundamentals;
- Algorithms and Complexity;
- Architecture of computers and operating systems;
- Program Design Method;
- Information management.

Moreover, the bachelor’s program is open to other disciplines. A solid basic education is offered in the following areas:

- Mathematics to model a situation and prove the accuracy of a statement;
- Statistics to be able to make a quantitative analysis of data;
- Economics, management and humanities to understand the socio-economic world in which IT tools are inserted.

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;
• Read, analyse and use technical documentation (diagrams, tutorials, ...);
• Prepare written documents taking into account contextual requirements and social conventions (manual, documentation, project report);
• Make a persuasive oral presentation using modern communication techniques.

5. demonstrate both rigorous, open and critical mind in his work

• Apply the standards of its discipline (terminology, quality standards in terms of documentation and programming methods, ...);
• Demonstrate critical attitude with respect to a technical solution, checking robustness and relevance in its context of use;
• Develop autonomously learning to remain competent in his field.

Programme structure

The student who enrols in the bachelor's programme in Computer Science will follow a programme of 180 credits, usually spread over 3 years. This programme includes a major of 150 credits and a minor of 30 credits.

- The major consists of a set of polyvalent courses of 79 credits in total and a set of Computer Science courses of 71 credits. The general polyvalent unication 59 RG [] 0.risjor on, iditteinmind thEcly licllyM angand sset oHu doe courseual,28s. The5• Re thMue form, ual,32s. The

⭘ 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

Year
1 2 3

List of available minors

Besides the core study, students will choose:

• the Additionnal module in Computer Science
• or one of the minors in the list below.

> Minor in Law (access) *[en-prog-2024-minadroi]*
> Minor in Urban Architecture *[en-prog-2024-minarch]*
> Minor in Information and Communication *[en-prog-2024-mincomu]*
> Minor in Culture and Creation *[en-prog-2024-mincucrea]*
> Minor in Scientific Culture *[en-prog-2024-mincults]*
> Minor in Development and Environment *[en-prog-2024-mindenv]*
> Minor : Issues of Transition and Sustainable Development (*) *[en-prog-2024-mindd]*
> Minor in Economics *[en-prog-2024-minecon]*
> Minor in European Studies *[en-prog-2024-mineuro]*
> Minor in Gender Studies *[en-prog-2024-mingenre]*
> Minor in Geography *[en-prog-2024-mingeog]*
> Minor in Management (ESPO students) *[en-prog-2024-minagest]*
> Minor in Human and Social Sciences *[en-prog-2024-minhuso]*
> Minor in Philosophy *[en-prog-2024-minfilo]*
> Minor in entrepreneurship (*) *[en-prog-2024-minmpme]*
> Minor in Musicology *[en-prog-2024-minmusi]*
> Minor in Law (openness) *[en-prog-2024-minodroi]*
> Additional module in computer science *[en-prog-2024-appsinf]*
> Minor in Statistics, Actuarial Sciences and Data Sciences *[en-prog-2024-minstat]*
> Minor in Dutch language and culture (*) *[Trl-minstat]*

Course prerequisites

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 puposes 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.

Prerequisities list

LANGL1282 "Anglais pour informaticiens II" has prerequisite(s) LANGL1181

- LANGL1181 - English for Computer Scientists I

LBIR1212 "Probabilités et statistiques (I)" has prerequisite(s) LINFO1111 ET LINFO1112

- LINFO1111 - Analysis
- LINFO1112 - Algebra

LECGE1222 "Microéconomie" has prerequisite(s) LCOPS1115

- LCOPS1115 - Economic Policy

LELEC1930 "Introduction aux télécommunications" has prerequisite(s) LINFO1140

- LINFO1140 - Electronic basics of computing

LEPL1402 "Informatique 2" has prerequisite(s) LINFO1101

- LINFO1101 - Introduction to programming

LEPL1509 "Projet 4 (en informatique)" has prerequisite(s) LEPL1402

- LEPL1402 - Informatics 2

LINFO1104 "Concepts des langages de programmation" has prerequisite(s) LINFO1101

- LINFO1101 prerequisite(s)

SINF1BA - 1ST ANNUAL UNIT

⊠ German courses

⊠ LALLE1101	German beginner's level 1st part (0-A1)	Fanny Desterbecq

SINF1BA - 2ND 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...)

Core study

General and training

Mathematics

LBIR1212	Probabilities and statistics (I)	Patrick Bogaert	FR [q1] [30h +15h] [4 Credits]
LINFO1113	Numerical algorithmic	Sébastien Jodogne Estelle Massart	

SINF1BA - 3RD 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...)

Core study

General and training

Mathematics

LEPL1109	Statistics and data sciences	Donatien Hainaut Laurent Jacques	FR [q1] [30h +30h] [5 Credits]

Scientific and technical Courses

LELEC1930	Intoduction to telecommunication	Jérôme Louveaux	FR [q2] [30h +15h] [5 Credits]

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

SINF1BA - Information

Access Requirements

Decree of 7 November 2013 defining the landscape of higher education and the academic organization of studies.
The admission requirements must be met prior to enrolment in the University.

In the event of the divergence between the different linguistic versions of the present conditions, the French version shall prevail.

SUMMARY

General access requirements

Except as otherwise provided by other specific legal provisions, admission to undergraduate courses leading to the award of a Bachelor's degree will be granted to students with one of the following qualifications :

1. A Certificate of Upper Secondary Education issued during or after the 1993-1994 academic year by an establishment offering full-time secondary education or an adult education centre in the French Community of Belgium and, as the case may be, approved if it was issued by an educational institution before 1 January 2008 or affixed with the seal of the French Community if it was issued after this date, or an equivalent certificate awarded by the Examination Board of the French Community during or after 1994;

2. A Certificate of Upper Secondary Education issued no later than the end of the 1992-1993 academic year, along with official documentation attesting to the student's ability to pursue higher education for students applying for a full-length undergraduate degree programme;

3. A diploma awarded by a higher education institution within the French Community that confers an academic degree issued under the above-mentioned Decree, or a diploma awarded by a university or institution dispensing full-time higher education in accordance with earlier legislation;

4. A higher education certificate or diploma awarded by an adult education centre;

5. A pass certificate for one of the entrance examinations organized by higher education institutions or by an examination board of the French Community; this document gives admission to studies in the sectors, fields or programmes indicated therein;

6. A diploma, certificate of studies or other qualification similar to those mentioned above, issued by the Flemish Community of Belgium,

- For any secondary school diploma **from a European Union country**, the admission request must contain the equivalence of your diploma or, at the very least, proof of the filing of the equivalence request with the Wallonia-Brussels Federation (French Community of Belgium). For any information relating to obtaining an equivalence, please refer to the following site.
- For any secondary school diploma **from a country outside the European Union**, the admission application must contain the equivalence of your diploma issued by the Wallonia-Brussels Federation (French Community of Belgium). If you have a restrictive equivalence for the programme of your choice, in addition of it, you **must** have either the DAES or a certificate of successful completion of the examination giving access to 1st cycle studies when you submit your application

Access based on validation of professional experience

Admission to undergraduate studies on the basis of accreditation of knowledge and skills obtained through professional or personal experience (Accreditation of Prior Experience)

Subject to the general requirements laid down by the authorities of the higher education institution, with the aim of admission to the undergraduate programme, the examination boards accredit the knowledge and skills that students have obtained through their professional or personal experience.

This experience must correspond to at least five years of documented activity, with years spent in higher education being partially taken into account: 60 credits are deemed equivalent to one year of experience, with a maximum of two years being counted. At the end of an assessment procedure organized by the authorities of the higher education institution, the Examination Board will decide whether a student has sufficient skills and knowledge to successfully pursue undergraduate studies.

After this assessment, the Examination Board will determine the additional courses and possible exemptions constituting the supplementary requirements for the student's admission.

Special requirements to access some programmes

- Admission to **undergraduate studies in engineering: civil engineering and architect**

  Pass certificate for the special entrance examination for undergraduate studies in engineering: civil engineering and architect.

  Admission to these courses is always subject to students passing the special entrance examination. Contact the faculty office for the programme content and the examination arrangements.
- Admission to **undergraduate studies in veterinary medicine**

  Admission to undergraduate studies in veterinary medicine is governed by the Decree of 16 June 2006 regulating the number of students in certain higher education undergraduate courses (non-residents).
- Admission to **undergraduate studies in physiotherapy and rehabilitation**

  Admission to undergraduate studies in physiotherapy and rehabilitation is governed by the Decree of 16 June 2006 regulating the number of students in certain higher education undergraduate courses (non-residents).
- Admission to **undergraduate studies in psychology and education: speech and language therapy**

  Admission to undergraduate studies in psychology and education: speech and language therapy is governed by the Decree of 16 June 2006 regulating the number of students in certain higher education undergraduate courses (non-residents).
- Admission to **undergraduate studies in medicine and dental science**

  Admission to undergraduate studies in medecine and dental science is governed by the Decree of 16 June 2006 regulating the number of students in certain higher education undergraduate courses (non-residents).

  Note: students wishing to enrol for a **Bachelor's degree in Medicine** or a **Bachelor's degree in dental science** must first sit an aptitude test (fr).
- Access to **Bachelor of Science in Business Engineering**

  The Bachelor of Science in Business Engineering is a joint program organised by KU Leuven and UCLouvain Saint-Louis Bruxelles. In order to register, all candidate must first submit an application via the KU Leuven admission platform. The conditions of access to this programme are specific.

Teaching method

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

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

The computer-science related components of the programme adhere to the standard curricula proposed by international standard organisations such as ACM and IEEE. This fosters student mobility to or from the numerous universities offering similar programmes that conform to these norms.

The programme respects the harmonisation rules established by universities of the CFB; the degree obtained upon completion of the programme therefore entitles direct access, without the need for any complementary prerequisites, to the master's programme in Computer Science at any one of those universities.

In the context of the master studies in Computer Science at UCL, the student also has the opportunity to participate in the Erasmus/ Socrates exchange programmes which UCL has subscribed to, together with universities from numerous European and extra-European countries, as well as with the Catholic University of Leuven (Katholieke Universiteit Leuven) in Flanders.

Possible trainings at the end of the programme

Access to the master's in Computer Science

• Secrétaire du Jury: Cristel Pelsser
• Président du Jury: Claude Oestges