

## Faculty of Applied Sciences



### SINF1BA Baccalauréat en sciences informatiques (Bachelor of Computing Science)

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#### Study objectives

##### General objectives

The bachelor's programme offers a **general approach to computing science** in the context of a basic university training course. The bachelor's programme in Computing Science leads to the title of "Bachelor of Computing Science". Upon completion of this first cycle of studies, the student will be able to access the master's programme in Computing Science. The university programme in Computing Science trains **future specialists capable of creating and elaborating efficient computing systems** to satisfy the numerous and ever-increasing needs in our society. It thus trains futur creators ("software architects") rather than builders. The bachelor's programme in Computing Science aims at the acquisition of the following **technical competence and skills** :

- In-depth comprehension of the basic essentials for creating and producing simple computer applications
- Mastery of the foundations of computing technologies
- Development of reasoning and abstraction abilities, necessary for the creation of these applications
- Mastery of the mathematical techniques needed to carry out such reasoning
- Acquisition of the knowledge and skills necessary for the future "master's in Computing Science" which will be orientated towards the engineering of complex software applications
- Attainment of lasting 'know-how', readily adaptable to the constant evolutions in computing: learning how to learn.

Computing science is the scientific and technical knowledge and skills that the student in computing science has to acquire to be able to become a professional computer scientist. This also includes other "life-tools", since these university studies aim to develop other skills, creativity and a critical mind. These studies, therefore, also train students to become *responsible human beings*, capable of apprehending the complex *socio-economic* world into which computing science is inserted and to take decisions which are both technically sound and humanly responsible. The bachelor's programme in Computing Sciences thus also aims at the acquisition of **other areas of competence** :

- Comprehension of the mechanisms which govern the socio-economic and/or technical environment in which a given computing application has to be integrated
- Integration of technical competence and skills in a pluridisciplinary context
- Development of intellectual curiosity, a synthetic mind, the capacity for critical reflection, sound communication skills and the ability to organise and manage course studies and learning

##### Objectives of the foundation studies

The objective of the foundation studies is to help the student to acquire a certain amount of special competence and skills related to Computing, Mathematics, the Basic Sciences and techniques, Economics and Management, Human Sciences and English.

#### General presentation of the programme

The student who enrolls for the bachelor's programme in Computing Science will follow a programme of 180 credits, usually spread over 3 years. This programme entitles access to the master's of Computing Science for 120 credits, usually spread over 2 years.

The programme includes a major of 150 credits and a minor of 30 credits.

- The **major consists of** a general polyvalent course of 82 credits and a course in Computing Science of 68 credits. The general polyvalent studies provide a solid training in Economics, Management and Human Sciences (34 credits) and in Mathematics (32 credits).
- The proposed **minor** will be a minor "imported" from another bachelor's programme (e.g. a minor in Management, a minor in Linguistics, a minor in Bio-engineering, a minor in Philosophy, a minor in Mathematics and Mathematical Applications, or a minor in Statistics). Alternatively, the student could choose a coherent set of options offered at UCL, subject to the approval of the Committee for the Bachelor of Computing Science.

A minor in Business Studies, specific to the bachelor's of Computing Science, has been jointly drawn up with the Faculty of Economics, Social and Political Sciences. In addition to the clear interest this holds for those future computer specialists wishing to strengthen the "business" dimension of the course, it also entitles access to the master's of Business Science.

A significant part of the course in Computing Science will focus on acquiring learning techniques through solving problems. In

other words, the elaboration of two projects will facilitate the integration of the various elements of the course work covered and confront the student with the patterns and aspects of small-scale projects (via laboratory work in the first year), and then medium-scale projects (via a project elaborated during the second quadrimester of the second year).

The Computing-related components of the programme fulfil the standard norms of the curricula determined by the international company experts in this domain (ACM, IEEE). This fosters student mobility to or from the numerous universities offering programmes which conform to these norms.

### **Principal Subjects**

Computing Studies - 69 credits

Mathematics- 32 credits

Economics and Management - 25 credits

Science and Techniques - 10 credits

Human Sciences - 8 credits

English - 6 credits

Minor - 30 credits

### **Evaluation**

The course content and activities are evaluated in accordance with the prevailing rules of the University (c.f. exam regulations). Most of the courses include at least one evaluation during the course of the quadrimester (ongoing evaluation), in addition to the final examination sessions (in January, June or September). The evaluations are in written or oral form. The specific evaluation details and procedures for all the courses are presented at the beginning of each period of studies.

### **Positioning of the programme**

#### **Access to the master's of Computing Science**

The bachelor's programme in Computing Science entitles direct access to the master's of Computing Science.

#### **Access to the master's of Business Science**

Students from the bachelor programme in Computing Science who have followed the minor in Business Studies (specific to the bachelor's in Computing Science) will have direct access to the master's in Business Science. This access requires a complement in Business studies and Languages, of 15 credits, to be added to the master's programme, (special dispensations can be obtained for the language studies). It also requires to complete a one week practical experience.

#### **Mobility.**

The programme fulfils the harmonisation rules drawn up by the CFB universities ; the degree awarded upon completion of the programme therefore entitles access, without the need for any complementary prerequisites, to the master's programme in Computing Science in any one of these universities.

The computing-related components of the programme fulfil the standard norms of the curricula laid down by the international company experts in this domain, (ACM, IEEE). This fosters student mobility to or from the numerous universities offering programmes which conform to these norms.

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

### **Useful contacts**

#### **Programme management**

**FSA** Faculté des sciences appliquées

Secretary's office for the Bachelor's Programme of Computing Sciences

Address : 1, rue Archimède

1348 Louvain-la-Neuve

Fax : +32 10 47 24 66

**FSA/INGI** : Department of Computer Engineering

Address : Place Sainte Barbe 2 - 1348 Louvain-la-Neuve

Tel: + 32 10 47 31 50

Fax: + 32 10 45 03 45

secret@info.ucl.ac.be.

#### **Contact person**

C. Poncin, tel : 010 47 31 76 - email : Chantal.Poncin@uclouvain.be

#### **Study Advisor**

C. Poncin, tel : 010 47 31 76 - email : Chantal.Poncin@uclouvain.be

#### **Exam Juries**

President: P. Sobieski

Secretary: B. Le Charlier

### List of accessible minors

- Minor in Theology
- Minor in Philosophy
- Minor in Law
- Minor in Criminology
- Minor in Information and Communication (\*)
- Minor in Political Sciences
- Minor in Sociology and Anthropology
- Minor in Human and Social Sciences
- Minor in Economics
- Minor in Business Studies
- Minor in Linguistics
- Minor in Hispanic Studies (\*)
- Minor in Italian Studies (\*)
- Minor in French Studies (\*)
- Minor in Latin Studies
- Minor in Greek Studies
- Minor in Oriental Studies
- Minor in Literature Studies
- Minor in History
- Minor in Medieval Studies
- Minor in History of Art and Archaeology (\*)
- Minor in Musicology
- Minor in Psychology and Education (\*)
- Minor in Human Nutrition
- Minor in General Biomedical Sciences
- Minor in Clinical Biomedical Sciences
- Minor in Medication Sciences (\*)
- Minor in Physical Activity, Health and Culture of Movement (\*)
- Minor in Mathematics
- Minor in Geography
- Minor in Statistics
- Minor in Urban Architecture
- Minor in Bio-engineering
- Minor in Biomedical Engineering
- Minor in Mathematics and Mathematical Applications
- Minor in Scientific Culture
- Minor in Gender Studies
- Minor in Culture and Creation
- Minor in European Studies

(\*) *Minor with access criteria.*

### Content of standard programme

A large part of the bachelor programme of Computing Sciences comprises an ensemble of compulsory courses ( **common pool of subjects** ) : *general and polyvalent* studies (Mathematics, Sciences and Techniques, Human Sciences, Economics and Management, Languages) and *Computing Studies* .

The student will complete this common pool by means of a coherent ensemble of courses (**minor**) in accordance with his preferences.

#### Common pool of subjects

Besides the courses in **computing** , the common pool of the bachelor programme comprising the compulsory courses aims to help the student to :

- acquire the **mathematical** tools necessary for the computer specialist as well as training in rigour and reasoning
- to apprehend, in an intuitive way, the essence of the physical phenomena and mechanisms ( **electronics and telecommunications** ) at the interface of computing, in order to understand the mode of functioning of the equipment used
- to master the fundamental concepts and mechanism **of economics** and of **management** within organisations, so as to be able to create computing systems which will be harmoniously integrated into the socio-economic environments for which they are destined
- to develop other human and linguistic skills.

## SINF 11BA First year of studies

### First quadrimester

<u>SINF1160</u>	Introduction à l'algorithmique et programmation, Partie 1[30h+30h] (6 credits)1q (in French)	Baudouin Le Charlier
<u>MAT1111B</u>	Mathématiques générales 1[45h+30h] (7 credits) (in French)	Patrick Habets
<u>FSAB1801</u>	Critical History of Science and Technology[15h+15h] (2 credits)1q (in French)	Patricia De Grave, Jacques Riche, David Vanderburgh
<u>ESPO1112</u>	Principles of Accountancy[30h+15h] (4 credits) (in French)	Karine Cerrada Cristia, Yves De Rongé (coord.), Michel De Wolf, Michel Gatz
<u>ANGL1370</u>	English : reading comprehension[30h] (3 credits)1q	Henri November

### Second quadrimester

<u>SINF1161</u>	Introduction à l'algorithmique et programmation, Partie 2[30h+30h] (6 credits)2q (in French)	Baudouin Le Charlier
<u>MAT1111C</u>	Mathématiques générales 1[30h+22.0h] (5 credits) (in French)	N.
<u>SINF1140</u>	Electronic bases of computer science[30h+30h] (6 credits)2q (in French)	Marc Lobelle
<u>FSAB1802</u>	Philosophy. Introductory Course[15h+15h] (3 credits)2q (in French)	Jean-Michel Counet, Nicolas Monseu (supplée Jean-Michel Counet)
<u>ECGE1122</u>	Management Accountancy[20h+15h] (3 credits) (in French)	Yves De Rongé (coord.), Michel De Wolf

### First and second quadrimesters

<u>ESPO1111</u>	Political Economics[60h+30h] (8 credits) (in French)	Paul Belleflamme, Philippe De Villé, Pierre Dehez, Jean Hindriks, Chantal Kegels, Xavier Wauthy
<u>SINF1151</u>	Problem solving using computers[0h+60h] (7 credits) (in French)	Kim Mens

## SINF 12BA Second year of studies

During the second year, the student will follow the sessions of the minor chosen, in addition to the courses mentioned below.

### First quadrimester

<u>BIR1200</u>	General mathematics II[52.5h+37.5h] (6 credits)1q (in French)	Pierre Bieliavsky
<u>BIR1203</u>	Probabilities and statistics (I)[30h+15h] (4 credits)1q (in French)	Patrick Bogaert
<u>ECGE1212</u>	Macroeconomics[45h+15h] (5 credits) (in French)	Philippe Monfort, Henri Sneessens
<u>ANGL1372</u>	Intermediate English for Computer Science (part two)[30h] (3 credits)1q	Henri November
<u>FSAB1402</u>	Informatique 2[30h+30h] (5 credits)1q (in French)	Pierre Dupont, Peter Van Roy (coord.)

### Second quadrimester

<u>SINF1250</u>	Mathematics for computer science[30h+15h] (7 credits)2q (in French)	Laurence Wolsey
<u>ECGE1222</u>	Microeconomics[45h+15h] (5 credits) (in French)	François Maniquet, Jacques-François Thisse
<u>SINF1252</u>	Introduction to computer systems[30h+30h] (5 credits)2q (in French)	Marc Lobelle
<u>SINF1124</u>	Programming project[0h+60h] (5 credits)2q (in French)	Marco Saerens

## SINF 13BA Third year of studies

During the third year, the student will follow the sessions of the minor chosen, in addition to the courses mentioned below..

### First quadrimester

<u>BIR1304</u>	Probability and statistics (II)[22.5h+15h] (3 credits)1q (in French)	Patrick Bogaert
<u>ECGE1317</u>	Organisational Theory[30h] (3 credits) (in French)	Matthieu de Nanteuil-Miribel
<u>INGI1101A</u>	Logique et structure discrètes[30h+30h] (5 credits)1q (in French)	N.
<u>SINF1121</u>	Algorithmics and data structures[30h+30h] (5 credits)1q (in French)	Pierre Dupont

	French)	
<u>INGI1113</u>	Operating systems 1[30h+30h] (5 credits)1q (in French)	Olivier Bonaventure
<b>Second quadrimester</b>		
<u>ELEC2930</u>	Intoduction to telecommunication[30h+15h] (4 credits)2q (in French)	Auguste Laloux
<u>INGI1122</u>	Program conception methods[30h+30h] (5 credits)2q (in French)	Baudouin Le Charlier
<u>INGI1131</u>	Computer language concepts[30h+30h] (5 credits)2q (in French)	Peter Van Roy
<u>INGI1123A</u>	Calculabilité[30h+30h] (5 credits)2q (in French)	N.
<u>INGI1271</u>	Files and databases[30h+30h] (5 credits)2q (in French)	Alain Pirotte

**Option : minor or courses according to choice**

To complete his programme, the student will choose a minor of 30 credits in accordance with one of the three possibilities mentioned below :

**1. Either, the minor in management, specific to the bachelor students of Computing Sciences**

You will find the information relevant to this sujet on the pages consacrated to the minors.

**2. or, another opening minor" imported " from other bachelor programmes**

The student will choose a minor (30 credits) from another faculty or institute of the University, or even an inter-faculty minor. For example, minor in Linguistics, minor in Bioengineering, minor in Philosophy, minor in Mathematics and Mathematical Applications or minor in Statistics...

**3. or, courses of the student's own choice**

The student may also choose a coherent ensemble of courses offered at UCL, subject to the approval of the Bachelor Committee of Computing Sciences.