INFO2 Ingénieur civil informaticien (Diploma of the Second Cycle (Ingénieur civil) in Computer studies)

Programme management

INGI Département d'ingénierie informatique
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Study objectives

The aim of the studies leading to the degree in Civil Engineering-Computer Studies is to train engineers capable both of creating complex computing systems for all domains of activites (industrial and others) and to supervise the elaboration thereof.

Admission conditions

The programme leading to a degree in Civil Engineering-Computer Studies is accessible to all students holding the first study cycle diploma ("candidature") in Civil Engineering. Industrial engineers and certain university degree holders in subjects relating to the Exact Sciences may also be entitled access, as may students with a foreign degree judged as being equivalent.

Admission procedure

The University admission and enrolment procedures are detailed in the section : "Access to studies" on the web page : http://www.ucl.ac.be/etudes/libres/acces.html

General structure of the programme

The study programme in Civil Engineering-Computer Studies, comprises several angles covering aspects from fundamental computing to concrete applications, with emphasis on computing engineering. The flexibility introduced by the organisation of the programme in terms of subject groups and modules allows for a wide range of training profiles, from a thorough specialisation in computing studies to a mixed specialisation (computer studies plus another engineering speciality).

Programme content

1. Programme composition

To obtain the degree in Civil Engineering-Computer Studies, the student must have already followed a programme comprising a minimum of 180 credits. Full details are available at the URL http://www.info.ucl.ac.be

General and polyvalent courses

General courses

The general studies courses are compulsory :

FSA2323	none[30h+15h] (4 credits) (in French)	Jean-Pierre Hansen, Yves Smeers
INGI2101	Discrete mathematics: logical foundations of computing science[30h+15h] (4 credits) (in French)	Philippe Delsarte, Axel Van Lamsweerde (coord.)
FSA2240	Gestion financière et comptable[30h+15h] (4 credits) (in French)	Philippe Grégoire
FSA2300	Religious Science Questions[15h] (2 credits) (in French)	Bernard Van Meenen

The student will choose at least one of the two following courses :

INMA2701	Applied mathematics : Signals and systems[30h+30h] (5 credits) (in French)	Luc Vandendorpe, Vincent Wertz
INMA2702	Applied mathematics : Optimization[30h+15h] (4 credits) (in French)	Vincent Blondel, François Glineur (supplée Vincent Blondel)

Polyvalence

Obligatory polyvalent module : polyvalence in Electronics

ELEC2525	Introduction to digital electronics[30h+30h] (5 credits) (in French)	Jean-Didier Legat, Michel Verleysen (supplée Jean-Didier Legat)
ELEC2531	Electronics II : Digital electronic circuits[30h+30h] (5 credits) (in French)	Jean-Didier Legat, Charles Trullemans

Other polyvalent courses

To be chosen with a view to attaining a minimum of 36 credits, together with the general courses and the compulsory polyvalent modules in Electronics.

Specialised courses

Subject groups

80.01. Computer Systems
80.02. Algorithmics and Data structures
80.03.Computing Languages and Translations
80.04. Networks, Distribution and Safety
80.05. Software Engineering
80.06. Artificial Intelligence
80.07. Information Systems

These modules will be followed in their complete form so as to provide a solid grounding in these subjects.

Options

The options will be chosen with the agreement of the Study Advisor, from among the following :

- the computing subjects linked to the orientations outlined below
- subjects from the other University programmes

Software Engineering orientation

To obtain an orientation in "Software Engineering", at least 25 credits must be taken from among the following courses, in addition to the basic courses :

INGI2355	Software engineering: advanced topics[30h+15h] (4 credits) (in French)	Kim Mens, Axel Van Lamsweerde (coord.)
INGI2359	Software engineering seminar[30h] (3 credits) (in French)	Axel Van Lamsweerde (coord.)
LINF2382	Travail collaboratif assisté par ordinateur[45h] (4 credits) (in French)	Jean Vanderdonckt
LINF2224	Programming methods[30h+15h] (4 credits) (in French)	Charles Pecheur
LINF2281	Gestion stratégique des systèmes d'information[30h] (3 credits) (in French)	Paul Belleflamme, Philippe Wilmes
LINF2282	Gestion de projets informatiques[30h+15h] (5 credits) (in French)	Manuel Kolp, Pierre Lavency
LINF2356	Interfaces homme-machine[45h] (5 credits) (in French)	Jean Vanderdonckt
LINF2335	Computer languages: advanced topics[30h+15h] (4 credits) (in French)	N.
INGI2346	Design of distributed applications[30h+15h] (4 credits) (in French)	Marc Lobelle (coord.), Peter Van Roy
INGI2347	System security[30h+15h] (4 credits) (in French)	Olivier Bonaventure (coord.), Baudouin Le Charlier, Jean-Jacques Quisquater, Peter Van Roy

Networks and Communication orientation

To obtain an orientation in "Networks and Communication", at least 25 credits must be taken from among the following courses, in addition to the basic courses :

INMA2701	Applied mathematics : Signals and systems[30h+30h] (5 credits) (in French)	Luc Vandendorpe, Vincent Wertz
ELEC2795	Telecommunications 2 : Digital transmission and radiocommunications[30h+30h] (5 credits) (in French)	Christophe Craeye, Luc Vandendorpe
INGI2346	Design of distributed applications[30h+15h] (4 credits) (in French)	Marc Lobelle (coord.), Peter Van Roy
LINF2345	Distributed applications: advanced topics[30h+15h] (4 credits) (in French)	Marc Lobelle, Peter Van Roy (coord.)
INGI2348	Information theory and coding[30h] (3 credits) (in French)	Philippe Delsarte (coord.), Benoît Macq
INGI2347	System security[30h+15h] (4 credits) (in French)	Olivier Bonaventure (coord.), Baudouin Le Charlier, Jean-Jacques Quisquater, Peter Van Roy
INGI2349	Network and communication seminar[30h] (3 credits) (in	Olivier Bonaventure (coord.), Marc

	French)	Lobelle
LINF2382	Travail collaboratif assisté par ordinateur[45h] (4 credits) (in French)	Jean Vanderdonckt

Artificial Intelligence orientation

To obtain an orientation in "artificial intelligence", at least 25 credits must be taken from among the following courses in addition to the basic studies :

INGI3637	Logics applied to artificial intelligence[30h] (3 credits) (in French)	N.
ELEC2870	Artificial neural networks[30h+30h] (5 credits) (in French)	Michel Verleysen
INGI2365	constraint programming[30h+15h] (4 credits) (in French)	Yves Deville (coord.), Peter Van Roy
INGI2368	Computational biology[30h+15h] (4 credits) (in French)	Yves Deville, Pierre Dupont (coord.)
INGI2369	Artificial intelligence seminar[30h] (3 credits) ∅ (in French)	Yves Deville, Pierre Dupont (coord.)
MATH2450	Mathematical logic[45h] (4.5 credits) (in French)	Jean-Roger Roisin
INMA2702	Applied mathematics : Optimization[30h+15h] (4 credits) (in French)	Vincent Blondel, François Glineur (supplée Vincent Blondel)
INMA2450	Combinatorial optimization[30h+15h] (4 credits) (in French)	Laurence Wolsey

Theoretical Computing orientation

To obtain an orientation in "Theoretical Computing", at least 25 credits must be taken from among the following courses in addition to the basic courses :

INGI2355	Software engineering: advanced topics[30h+15h] (4 credits) (in French)	Kim Mens, Axel Van Lamsweerde (coord.)
LINF2224	Programming methods[30h+15h] (4 credits) (in French)	Charles Pecheur
INGI2339	Language and translator seminar[30h] (3 credits) ⊕ (in French)	Baudouin Le Charlier (coord.), Peter Van Roy
LINF2335	Computer languages: advanced topics[30h+15h] (4 credits) △ (in French)	N.
INGI2348	Information theory and coding[30h] (3 credits) (in French)	Philippe Delsarte (coord.), Benoît Macq
INGI2365	constraint programming[30h+15h] (4 credits) (in French)	Yves Deville (coord.), Peter Van Roy
INGI3637	Logics applied to artificial intelligence[30h] (3 credits) (in French)	N.
MATH2450	Mathematical logic[45h] (4.5 credits) (in French)	Jean-Roger Roisin
INGI2368	Computational biology[30h+15h] (4 credits) (in French)	Yves Deville, Pierre Dupont (coord.)
INMA2710	Numerical algorithms[30h+15h] (4 credits) (in French)	Paul Van Dooren
INMA2111	Discrete mathematics II : Algorithms and complexity[30h+15h] (4 credits) (in French)	Vincent Blondel, Laurence Wolsey, Laurence Wolsey (supplée Vincent Blondel)
INMA2691	DISCRETE MATHEMATICS - GRAPH THEROY AND ALGORITHMS (in French)	
MATH2395	Discrete mathematics - combinatorial strucutres[30h] (3 credits) (in French)	Philippe Delsarte, Jean-Pierre Tignol
INGI2347	System security[30h+15h] (4 credits) (in French)	Olivier Bonaventure (coord.), Baudouin Le Charlier, Jean-Jacques Quisquater, Peter Van Roy
MATH2380	Number theory[30h] (3 credits) (in French)	Jean-Jacques Quisquater, Jean-Pierre Tignol
MATH2350	Cryptography[22.5h] (2.5 credits) (in French)	Jean-Jacques Quisquater
INMA2702	Applied mathematics : Optimization[30h+15h] (4 credits) (in French)	Vincent Blondel, François Glineur (supplée Vincent Blondel)
INMA2450	Combinatorial optimization[30h+15h] (4 credits) (in French)	Laurence Wolsey
INMA2470	Discrete stochastic models[30h+22.5h] (5 credits) (in French)	Philippe Chevalier
INMA2731	Stochastic processes : Estimation and prediction[30h+30h] (5 credits) (in French)	Michel Gevers, Luc Vandendorpe

Minor orientation in another speciality

C.f. existing reglementation for the other degree programmes.

Language course

The students may follow various language courses organised by the ILV. These courses are recognised to the value of 90 hours (3 credits per course). Furthermore, one of these courses may be at an introductory level.

A specific course aimed to improve the linguistic skills and the professional interactive communication capacity of the students, is especially organised for the FSA students.

ANGL2470	English communication skills for engineers[30h] (3 credits)	Ahmed Adrioueche, Henri November, Severine Schmit

Apprenticeship

The students are encouraged to do an apprenticeship in an enterprise for a minimal duration of three weeks during their second study cycle. This apprenticeship represents 3 credits (30 hours) of the overall volume of their programme. It is subject to the prior approval of the degree programme Management Committee and concludes with a report. It will be ratified by an evaluation specifying "has/has satisfied the requirements".

End of course thesis

This piece of work represents 30 credits.

2. Programme per year of studies

The programmes listed below only present the compulsory courses. The student will complete his programme in line with the rules for the INFO 2 programme constitution in agreement with his study advisor. The programme for each year comprises around 60 credits of courses.

INFO 21 First year

First quadrimester

LINF2121	Algorithmics and data structures[30h+30h] (5 credits) (in French)	Pierre Dupont (coord.), Baudouin Le Charlier, Kim Mens
INGI2122	Program conception methods[30h+30h] (5 credits) (in French)	Yves Deville, Baudouin Le Charlier (coord.)
INGI2113	Structure and use to computer systems[30h+30h] (5 credits) (in French)	Olivier Bonaventure, Marc Lobelle (coord.), Peter Van Roy
INGI2114	Computer system design[30h+30h] (5 credits) (in French)	Olivier Bonaventure, Marc Lobelle (coord.), Peter Van Roy

10 credits of polyvalent and general courses

Second quadrimester

INGI2131	Computer language concepts[30h+30h] (5 credits) (in French)	Baudouin Le Charlier, Peter Van Roy (coord.)
INGI2132	Languages and translators[30h+30h] (5 credits) (in French)	Baudouin Le Charlier (coord.), Peter Van Roy
INGI2141	Computer networks: information transfer[30h+30h] (5 credits) (in French)	Olivier Bonaventure (coord.), Marc Lobelle, Peter Van Roy
INGI2142	Computer networks: configuration and management[30h+30h] (5 credits) (in French)	Olivier Bonaventure (coord.), Marc Lobelle, Peter Van Roy
INGI2123	Calculability and complexity[30h+15h] (4 credits) (in French)	Yves Deville (coord.), Pierre Dupont, Baudouin Le Charlier

6 credits of polyvalent and general courses

INFO 22 Second year

First quadrimester

INGI2251	Software engineering: development methods[30h+30h] (5 credits) (in French)	Axel Van Lamsweerde (coord.)
INGI2255	Software engineering project[0h+60h] (5 credits) (in French)	Axel Van Lamsweerde (coord.)
INGI2261	Artificial intelligence: representation and reasoning[30h+30h] (5 credits) (in French)	Yves Deville (coord.), Pierre Dupont, Axel Van Lamsweerde
INGI2262	artificial intelligence: learning and recognitiopn[30h+30h] (5 credits) (in English)	Yves Deville, Pierre Dupont (coord.), Marco Saerens
ELEC2525	Introduction to digital electronics[30h+30h] (5 credits) (in French)	Jean-Didier Legat, Michel Verleysen (supplée Jean-Didier Legat)
ELEC2531	Electronics II : Digital electronic circuits[30h+30h] (5 credits) (in French)	Jean-Didier Legat, Charles Trullemans

Second quadrimester

INGI2252	Software Engineering: Maintenance[30h+30h] (5 credits) (in English)	Kim Mens (coord.), Axel Van Lamsweerde
INGI2271	Database management systems[30h+30h] (5 credits) (in French)	Alain Pirotte (coord.), Marco Saerens
LINF2172	Database design[30h+30h] (5 credits) (in French)	Manuel Kolp, Alain Pirotte (coord.), Marco Saerens

15 credits of polyvalent, general courses and advanced courses

INFO 23 Third year

INFO4020 Travail de fin d'études (in French) N.
30 credits of polyvalent, general course and advanced courses