

Master in cybersecurity

Focus Cryptanalysis and Forensics

The programme is organised around **five specific and complementary key disciplines**: (1) Cryptography, (2) Systems and Networks, (3) Legal, ethical, and human aspects, (3) Security management, and (5) Secure software engineering.

The **first year** of the Master is dedicated to a **common set of courses**. Several seminars and elective courses ensure the **curriculum is dynamic and remains up to date**. For instance, 10 credits can be chosen as **elective courses**, selected from courses already taught in the participating academic institutions.

In the second year, half of the programme's credits are for courses in one of **two focuses**: 'system design and analysis', which is dedicated to the design and thorough analysis of secure systems, and 'corporate strategies', which is dedicated to more concrete applications. Both focuses are built on the **students' personal involvement and self-learning, through several projects**. A significant part of the skills involved is acquired during the **mandatory long-term work placement in a professional environment** (typically 12 weeks).

Students take part in **projects and challenges** that further add to the expertise and practical know-how required in the IT industry. They apply the concepts covered in lectures, and learn new material by solving proposed challenges.

At the end of the programme, students prepare a **Master's dissertation** under the supervision of a professor who is an active researcher in the field.

Bloc 1 | M-SECUC | MA-SECU

Cours obligatoires

ELEC-H504	Network Security Jean-Michel DRICOT (Coordinator) ⌚ 5 credits [lecture: 24h, practical work: 12h] 📅 second term 🗨 English
ELEC-H550	Embedded System Security Jan Tobias Mühlberg (Coordinator) ⌚ 5 credits [lecture: 24h, practical work: 36h] 📅 second term 🗨 English
INFO-F514	Protocols, cryptanalysis and mathematical cryptology Christophe PETIT (Coordinator) ⌚ 5 credits [lecture: 24h] 📅 second term 🗨 English
INFO-Y023	Cryptography Olivier PEREIRA ⌚ 5 credits [lecture: 30h, tutorial classes: 15h] 📅 first term 🗨 English
INFO-Y024	📅 unknown term
INFO-Y025	Cybersecurity challenge Jérôme DOSSOGNE ⌚ 5 credits 📅 academic year 🗨 English
INFO-Y111	Computer system security ⌚ 5 credits [lecture: 30h, tutorial classes: 15h] 📅 second term 🗨 English
INFO-Y112	Machine learning and data mining ⌚ 5 credits [lecture: 30h, practical work: 15h] 📅 first term 🗨 English
INFO-Y113	Management of security Thibault Debatty (Coordinator) and Wim Mees ⌚ 5 credits [lecture: 24h, practical work: 24h] 📅 second term 🗨 English
INFO-Y114	Legal aspects of IT security ⌚ 5 credits [lecture: 30h] 📅 first term 🗨 English
INFO-Y115	Secure software design and web security Romain ABSIL (Coordinator) ⌚ 5 credits [lecture: 30h, practical work: 20h] 📅 first term 🗨 English
INFO-Y124	Corporate information security Charles CUVELLIEZ (Coordinator) ⌚ 5 credits [lecture: 30h, practical work: 30h] 📅 second term 🗨 English

Master in cybersecurity

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Bloc 2 | M-SECUC | MA-SECU

Cours obligatoires

An alternative chosen from the four following

Module 4 - HE2B-HELB

INFO-Y063
(optional)

Organisation of Corporate Security

10 credits academic year English

INFO-Y119
(optional)

Forensics and reverse engineering | Thibault Debatty (Coordinator)

5 credits [lecture: 24h, practical work: 24h] first term English

INFO-Y122
(optional)

Security Analysis: from audits to red teaming | Jérôme DOSSOGNE (Coordinator)

5 credits [lecture: 30h, practical work: 30h] first term English

INFO-Y123
(optional)

Human factors in information security | Jérôme DOSSOGNE (Coordinator)

10 credits [lecture: 60h, practical work: 60h] first term English

MEMO-Y007
(optional)

Master Thesis

20 credits [mfe/tfe: 240h] academic year English

STAG-Y006
(optional)

Internship

10 credits [work placement: 120h] academic year French

or

Module 3 - UNamur

INFO-Y054
(optional)

Ethical aspects of IT and IT security | Marie-des-neiges RUFFO

5 credits [lecture: 30h] second term English

INFO-Y056
(optional)

Data Analysis for cybersecurity | Florentin ROCHET

5 credits [lecture: 30h, tutorial classes: 15h] first term English

INFO-Y057
(optional)

Program Analysis for Cybersecurity | Xavier DEVROEY and Wim Vanhoof

5 credits [lecture: 30h, tutorial classes: 15h] first term English

INFO-Y058
(optional)

Security of Applications | Florentin ROCHET

5 credits [lecture: 30h, tutorial classes: 30h] second term English

INFO-Y059
(optional)

Software Verification and validation | Xavier DEVROEY and Benoit Vanderose

5 credits [lecture: 30h, tutorial classes: 15h] second term English

INFO-Y062
(optional)

Automated Software Engineering

5 credits [lecture: 30h, tutorial classes: 15h] second term English

MEMO-Y006
(optional)

Master Thesis

20 credits [mfe/tfe: 240h] academic year English

STAG-Y005
(optional)

Internship

10 credits [work placement: 120h] academic year English

or

Module 2 - UCLouvain

MEMO-Y004
(optional)

Master thesis

🕒 20 credits [mfe/tfe: 240h] 📅 academic year 🗨 English

40 ECTS à choisir parmi

A total of 40 credits chosen from the following

INFO-Y026
(optional)

Secure Electronic Circuits and Systems | François-Xavier STANDAERT

🕒 5 credits [lecture: 30h, tutorial classes: 30h, work placement: 120h] 📅 second term 🗨 English

INFO-Y027
(optional)

Privacy enhancing technologies | Olivier PEREIRA and François-Xavier STANDAERT

🕒 5 credits [lecture: 30h, tutorial classes: 30h] 📅 first term 🗨 English

INFO-Y028
(optional)

Secured Systems Engineering | Axel LEGAY

🕒 5 credits [lecture: 30h, tutorial classes: 15h] 📅 second term 🗨 English

INFO-Y029
(optional)

Mining patterns in data | Siegfried NIJSSEN

🕒 5 credits [lecture: 30h, tutorial classes: 15h] 📅 second term 🗨 English

INFO-Y031
(optional)

Algorithms in data science | Vincent BLONDEL, Jean-Charles DELVENNE and Gautier KRINGS

🕒 5 credits [lecture: 30h, tutorial classes: 22,5h] 📅 first term 🗨 English

INFO-Y032
(optional)

Mobile and embedded computing | Ramin SADRE

🕒 5 credits [lecture: 30h, tutorial classes: 15h] 📅 second term 🗨 English

INFO-Y034
(optional)

Design of embedded and real time systems | Cristel PELSSER

🕒 5 credits [lecture: 30h, tutorial classes: 30h] 📅 second term 🗨 English

INFO-Y035
(optional)

Architecture and performance of computer systems | Tom BARBETTE

🕒 5 credits [lecture: 30h, tutorial classes: 30h] 📅 first term 🗨 English

INFO-Y042
(optional)

Information theory and coding | Jérôme LOUVEAUX, Benoit MACQ and Olivier PEREIRA

🕒 5 credits [lecture: 30h, tutorial classes: 15h] 📅 second term 🗨 English

INFO-Y043
(optional)

Théorie des nombres | Pierre-Emmanuel CAPRACE and Olivier PEREIRA

🕒 5 credits [lecture: 30h, tutorial classes: 15h] 📅 first term 🗨 French

INFO-Y044
(optional)

Machine learning : regression, deep networks and dimensionality reduction | John LEE and Michel VERLEYSEN

🕒 5 credits [lecture: 30h, tutorial classes: 30h] 📅 first term 🗨 English

STAG-Y004
(optional)

Internship

🕒 10 credits [work placement: 120h] 📅 academic year 🗨 English

or

Module 1 - ULB

ELEC-H423
(optional)

📅 unknown term

ELEC-H473
(optional)

Microprocessor architecture | Dragomir MILOJEVIC (Coordinator)

🕒 5 credits [lecture: 24h, practical work: 36h] 📅 second term 🗨 English

INFO-Y119
(optional)

Forensics and reverse engineering | Thibault Debatty (Coordinator)

🕒 5 credits [lecture: 24h, practical work: 24h] 📅 first term 🗨 English

INFO-Y122
(optional)

Security Analysis: from audits to red teaming | Jérôme DOSSOGNE (Coordinator)

🕒 5 credits [lecture: 30h, practical work: 30h] 📅 first term 🗨 English



MEMO-F001
(optional)

Master Thesis | Jean-Michel DRICOT (Coordinator) and Olivier MARKOWITCH

🕒 20 credits [mfe/tfe: 240h] 📅 academic year 🗨️ French

STAG-F009
(optional)

Security analysis internship | Jean-Michel DRICOT (Coordinator) and Olivier MARKOWITCH

🕒 10 credits [work placement: 120h] 📅 first and second terms 🗨️ French

10 ECTS à choisir parmi

A total of ten credits chosen from the following

GEST-S482
(optional)

The digital firm | Nicolas VAN ZEEBROECK (Coordinator) and Vincent LION

🕒 5 credits [lecture: 36h, tutorial classes: 24h] 📅 first term 🗨️ English

GEST-S706
(optional)

Entrepreneurship | Olivier WITMEUR (Coordinator) and Ant BOZKAYA

🕒 5 credits [lecture: 24h] 📅 second term 🗨️ English

INFO-F404
(optional)

Real-Time Operating Systems | Joël GOOSSENS (Coordinator)

🕒 5 credits [lecture: 24h, tutorial classes: 12h, project: 30h] 📅 first term 🗨️ English

INFO-F409
(optional)

Learning dynamics | Tom LENAERTS (Coordinator)

🕒 5 credits [lecture: 24h, project: 60h] 📅 first term 🗨️ English