

Master in cybersecurity Focus Cryptalalysis 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	O 5 credits [lecture: 24h, practical work: 12h] ⁽¹⁾ second term C English
ELEC-H550	Image: Security Jan Tobias Mühlberg (Coordinator) Image: Security Second term Image: Security Security Image: Security Security
INFO-F514	Protocols, cryptanalysis and mathematical cryptology Christophe PETIT (Coordinator) ③ 5 credits [lecture: 24h]
INFO-Y023	Cryptography Olivier PEREIRA [⊙] 5 credits [lecture: 30h, tutorial classes: 15h] ^m first term [©] English
INFO-Y024	Cloud computing Etienne Rivière ⊙ 5 credits [lecture: 30h, practical work: 15h]
INFO-Y025	Cybersecurity challenge Jérôme DOSSOGNE ② 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 ③ 5 credits [lecture: 30h, practical work: 15h] 简 first term 〇 English
INFO-Y113	Management of security Thibault Debatty (Coordinator) and Wim Mees ③ 5 credits [lecture: 24h, practical work: 24h] ⁽¹⁾ second term ⁽²⁾ English
INFO-Y114	Legal aspects of IT security ⊙ 5 credits [lecture: 30h] ☆ 5 credits [lecture: 30h]
INFO-Y115	Secure software design and web security Romain ABSIL (Coordinator) ③ 5 credits [lecture: 30h, practical work: 20h]
INFO-Y124	Corporate information security Charles CUVELLIEZ (Coordinator) ⊙ 5 credits [lecture: 30h, practical work: 30h] 🛗 second term 🔎 English



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Bloc 2 | M-SECUC | MA-SECU

Cours obligatoires

	Module 1 – ULB		
ELEC-H423	Mobile and wireless networks Jean-Michel DRICOT (Coordinator) ③ 5 credits [lecture: 36h, practical work: 24h] ^m first term		
ELEC-H473	Microprocessor architecture Dragomir MILOJEVIC (Coordinator) ⊙ 5 credits [lecture: 24h, practical work: 36h] 🛗 second term 📿 English		
INFO-Y119	O 5 credits [lecture: 24h, practical work: 24h] Image: First term English		
INFO-Y122	Security Analysis: from audits to red teaming Jérôme DOSSOGNE (Coordinator) 3 5 credits [lecture: 30h, practical work: 30h] first term Find English		
MEMO-F001	Master Thesis Jean-Michel DRICOT (Coordinator) and Olivier MARKOWITCH ② 20 credits [mfe/tfe: 240h] ⁽¹⁾ academic year		
STAG-F009	Security analysis internship Jean-Michel DRICOT (Coordinator) and Olivier MARKOWITCH 10 credits [work placement: 120h] 11 first and second terms 12 French		
A total of ten credits chosen from the following			
GEST-S482 (optional)	The digital firm Nicolas VAN ZEEBROECK (Coordinator) and Vincent LION Image: State of the stat		
GEST-S706 (optional)	Entrepreneurship Olivier WITMEUR (Coordinator) and Ant BOZKAYA O 5 credits [lecture: 24h] 📋 second term 🔎 English		
INFO-F404 (optional)	Real-Time Operating Systems Joël GOOSSENS (Coordinator) ③ 5 credits [lecture: 24h, tutorial classes: 12h, project: 30h]		
INFO-F409 (optional)	Learning dynamics Tom LENAERTS (Coordinator) ③ 5 credits [lecture: 24h, project: 60h]		
INFO-H415 (optional)	Advanced databases Esteban ZIMANYI (Coordinator) ② 5 credits [lecture: 24h, tutorial classes: 12h, practical work: 30h] 🛗 first term 🜻 English		
INFO-H420 (optional)	Management of Data Science and Business Workflows Dimitrios SACHARIDIS (Coordinator) ③ 5 credits [lecture: 24h, tutorial classes: 36h]		
INFO-H514 (optional)	Quantum information and computation Ognyan Oreshkov (Coordinator)		
TEMP-0000 (optional)	Cours extérieurs au programme ∅ 5 credits ⁽¹⁾ academic year		

Module 2 - UCLouvain

MEMO-Y004 Master thesis

② 20 credits [mfe/tfe: 240h]
🗂 academic year
② English



A total of 40 credits chosen from the following

INFO-Y027 (optional)	Privacy enhancing technologies Olivier PEREIRA and François-Xavier STANDAERT ③ 5 credits [lecture: 30h, tutorial classes: 30h] — first term
INFO-Y028 (optional)	Secured Systems Engineering Axel LEGAY ② 5 credits [lecture: 30h, tutorial classes: 15h] ☐ second term > English
INFO-Y029 (optional)	Mining patterns in data Siegfried NIJSSEN ③ 5 credits [lecture: 30h, tutorial classes: 15h]
INFO-Y031 (optional)	Algorithms in data science Vincent BLONDEL, Jean-Charles DELVENNE and Gautier KRINGS ③ 5 credits [lecture: 30h, tutorial classes: 22,5h] 🖞 first term 👂 English
INFO-Y032 (optional)	Mobile and embedded computing Ramin SADRE ③ 5 credits [lecture: 30h, tutorial classes: 15h]
INFO-Y034 (optional)	Oesign of embedded and real time systems Cristel PELSSER ③ 5 credits [lecture: 30h, tutorial classes: 30h]
INFO-Y035 (optional)	Architecture and performance of computer systems Tom BARBETTE ③ 5 credits [lecture: 30h, tutorial classes: 30h]
INFO-Y042 (optional)	Information theory and coding Jérôme LOUVEAUX, Benoit MACQ and Olivier PEREIRA ③ 5 credits [lecture: 30h, tutorial classes: 15h] 🛗 second term 📿 English
INFO-Y043 (optional)	Théorie des nombres Pierre-Emmanuel CAPRACE and Olivier PEREIRA ③ 5 credits [lecture: 30h, tutorial classes: 15h] ⁽¹⁾ first term ⁽²⁾ French
INFO-Y044 (optional)	Machine learning : regression, deep networks and dimensionality reduction John LEE and Michel VERLEYSEN ② 5 credits [lecture: 30h, tutorial classes: 30h]
STAG-Y004 (optional)	Internship ② 10 credits [work placement: 120h] academic year 🔎 English
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	Module 3 - UNamur

S credits [lecture: 30h] Second term English INFO-Y056 Data Analysis for cybersecurity | Florentin ROCHET S credits [lecture: 30h, tutorial classes: 15h] first term English INFO-Y057 Program Analysis for Cybersecurity | Xavier DEVROEY and Wim Vanhoof S credits [lecture: 30h, tutorial classes: 15h] first term English INFO-Y058 Security of Applications | Florentin ROCHET S credits [lecture: 30h, tutorial classes: 30h] Second term English INFO-Y059 Software Verification and validation | Xavier DEVROEY and Benoit Vanderose

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

INFO-Y062 Automated Software Engineering

INFO-Y054

🕑 5 credits [lecture: 30h, tutorial classes: 15h] 🛛 🛗 second term 🛛 💭 English

MEMO-Y006 Master Thesis ② 20 credits [mfe/tfe: 240h] 🗂 academic year ② English

STAG-Y005 Internship

O 10 credits [work placement: 120h]
C academic year

Module 4 - HE2B-HELB

INFO-Y063 Organisation of Corporate Security © 10 credits 🗂 academic year 🔎 English

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INFO-Y119	O 5 credits [lecture: 24h, practical work: 24h] Image: First term English
INFO-Y122	Security Analysis: from audits to red teaming Jérôme DOSSOGNE (Coordinator) ② 5 credits [lecture: 30h, practical work: 30h]
INFO-Y123	O 10 credits [lecture: 60h, practical work: 60h] Image: first term English
MEMO-Y007	Master Thesis ④ 20 credits [mfe/tfe: 240h]

STAG-Y006 Internship

🕑 10 credits [work placement: 120h] 🛛 📋 academic year 🛛 \bigcirc French