

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]  first term  English
- INFO-F514 **Protocols, cryptanalysis and mathematical cryptology** | Christophe PETIT (Coordinator) and Liran LERMAN
 5 credits [lecture: 24h]  second term  English
- INFO-Y023 **Cryptography** | Olivier PEREIRA
 5 credits [lecture: 30h, tutorial classes: 15h]  first term  English
- INFO-Y024 **Cloud computing** | Etienne Rivière
 5 credits [lecture: 30h, practical work: 15h]  first term  English
- INFO-Y025 **Cybersecurity challenge** | Jérôme DOSSOGNE
 5 credits  academic year  English
- INFO-Y111 **Computer system security** | Ramin SADRE
 5 credits [lecture: 30h, tutorial classes: 15h]  second term  English
- INFO-Y112 **Machine learning and data mining** | Katrien BEULS
 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** | Elise DELHAISE
 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

Focus Cryptanalysis and Forensics

Bloc 2 | M-SECUC | MA-SECU

Cours obligatoires

Module 1 - ULB

- ELEC-H423 **Mobile and wireless networks** | Jean-Michel DRICOT (Coordinator)
 ⌚ 5 credits [lecture: 36h, practical work: 24h] 📅 first term 🗨 English
- ELEC-H473 **Microprocessor architecture** | Dragomir MILOJEVIC (Coordinator) and Jan Tobias Mühlberg
 ⌚ 5 credits [lecture: 24h, practical work: 36h] 📅 second term 🗨 English
- INFO-Y119 **Forensics and reverse engineering** | Thibault Debatty (Coordinator)
 ⌚ 5 credits [lecture: 24h, practical work: 24h] 📅 first term 🗨 English
- INFO-Y122 **Security Analysis: from audits to red teaming** | Jérôme DOSSOGNE (Coordinator)
 ⌚ 5 credits [lecture: 30h, practical work: 30h] 📅 first term 🗨 English
- MEMO-F001 **Master Thesis** | Jean-Michel DRICOT (Coordinator) and Olivier MARKOWITCH
 ⌚ 20 credits [mfe/tfe: 240h] 📅 academic year 🗨 English
- STAG-F009 **Security analysis internship** | Jean-Michel DRICOT (Coordinator) and Olivier MARKOWITCH
 ⌚ 10 credits [work placement: 120h] 📅 academic year 🗨 English

A total of ten credits chosen from the following

- GEST-S482 (optional) **The digital firm** | Vincent LION (Coordinator) and Nicolas VAN ZEEBROECK
 ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 first term 🗨 English
- GEST-S706 (optional) **Entrepreneurship** | Olivier WITMEUR (Coordinator) and Ant Bozkaya
 ⌚ 5 credits [lecture: 24h] 📅 first 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) and Ann NOWE
 ⌚ 5 credits [lecture: 24h, practical work: 24h, project: 60h] 📅 first term 🗨 English
- INFO-H415 (optional) **Advanced databases** | Esteban ZIMANYI (Coordinator)
 ⌚ 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)
 ⌚ 5 credits [lecture: 24h, tutorial classes: 36h] 📅 first term 🗨 English
- INFO-H514 (optional) **Quantum information and computation I** | Ognyan ORESHKOV (Coordinator)
 ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 second term 🗨 English
- TEMP-0000 (optional) **Cours extérieurs au programme**
 ⌚ 5 credits 📅 academic year 🗨 French

Module 2 - UCLouvain

- MEMO-Y004 **Master thesis**
 ⌚ 20 credits [mfe/tfe: 240h] 📅 academic year 🗨 English

A total of 40 credits chosen from the following

INFO-Y026 <small>(optional)</small>	Secure Electronic Circuits and Systems François-Xavier STANDAERT ⌚ 5 credits [lecture: 30h, tutorial classes: 30h] 📅 second term 🗨 English
INFO-Y027 <small>(optional)</small>	Privacy enhancing technologies Olivier PEREIRA and François-Xavier STANDAERT ⌚ 5 credits [lecture: 30h, tutorial classes: 30h] 📅 first term 🗨 English
INFO-Y028 <small>(optional)</small>	Secured Systems Engineering Axel LEGAY ⌚ 5 credits [lecture: 30h, tutorial classes: 15h] 📅 second term 🗨 English
INFO-Y029 <small>(optional)</small>	Mining patterns in data Siegfried NIJSSEN ⌚ 5 credits [lecture: 30h, tutorial classes: 15h] 📅 second term 🗨 English
INFO-Y031 <small>(optional)</small>	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 <small>(optional)</small>	Mobile and embedded computing Ramin SADRE ⌚ 5 credits [lecture: 30h, tutorial classes: 15h] 📅 second term 🗨 English
INFO-Y034 <small>(optional)</small>	Design of embedded and real time systems Cristel PELSSER ⌚ 5 credits [lecture: 30h, tutorial classes: 30h] 📅 second term 🗨 English
INFO-Y035 <small>(optional)</small>	Architecture and performance of computer systems Tom BARBETTE ⌚ 5 credits [lecture: 30h, tutorial classes: 30h] 📅 first term 🗨 English
INFO-Y042 <small>(optional)</small>	Information theory and coding Jérôme LOUVEAUX, Benoit MACQ and Olivier PEREIRA ⌚ 5 credits [lecture: 30h, tutorial classes: 15h] 📅 second term 🗨 English
INFO-Y043 <small>(optional)</small>	Théorie des nombres Pierre-Emmanuel CAPRACE and Olivier PEREIRA ⌚ 5 credits [lecture: 30h, tutorial classes: 15h] 📅 first term 🗨 French
INFO-Y044 <small>(optional)</small>	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 <small>(optional)</small>	Internship ⌚ 10 credits [work placement: 120h] 📅 academic year 🗨 English
TEMP-0000 <small>(optional)</small>	Cours extérieurs au programme ⌚ 5 credits 📅 academic year 🗨 French

Module 3 - UNamur

INFO-Y054	Ethical aspects of IT and IT security Marie-des-neiges RUFFO ⌚ 5 credits [lecture: 30h] 📅 second term 🗨 English
INFO-Y056	Data Analysis for cybersecurity Florentin ROCHET ⌚ 5 credits [lecture: 30h, tutorial classes: 15h] 📅 first term 🗨 English
INFO-Y057	Program Analysis for Cybersecurity Xavier DEVROEY and Wim Vanhoof ⌚ 5 credits [lecture: 30h, tutorial classes: 15h] 📅 first term 🗨 English
INFO-Y058	Security of Applications Romain Absil (Coordinator) and Florentin ROCHET ⌚ 5 credits [lecture: 30h, tutorial classes: 30h] 📅 second term 🗨 English
INFO-Y059	Software Verification and validation Xavier DEVROEY and Benoit Vanderose ⌚ 5 credits [lecture: 30h, tutorial classes: 15h] 📅 second term 🗨 English
INFO-Y062	Automated Software Engineering Fanny Boraita Amador, Xavier DEVROEY, Amélie Notaro, Florentin ROCHET, Benoit Vanderose and Wim Vanhoof ⌚ 5 credits [lecture: 30h, tutorial classes: 15h] 📅 second term 🗨 English
MEMO-Y006	Master Thesis ⌚ 20 credits [mfe/tfe: 240h] 📅 academic year 🗨 English



STAG-Y005 **Internship**
🕒 10 credits [work placement: 120h] 📅 academic year 🗨 English

Module 4 - HE2B-HELB

INFO-Y063 **Organisation of Corporate Security** | Gaël Hachez (Coordinator)
🕒 5 credits [lecture: 30h, practical work: 30h] 📅 second term 🗨 English

INFO-Y119 **Forensics and reverse engineering** | Thibault Debatty (Coordinator)
🕒 5 credits [lecture: 24h, practical work: 24h] 📅 first term 🗨 English

INFO-Y122 **Security Analysis: from audits to red teaming** | Jérôme DOSSOGNE (Coordinator)
🕒 10 credits [lecture: 60h, practical work: 60h] 📅 first term 🗨 English

INFO-Y123 **Human factors in information security** | Jérôme DOSSOGNE (Coordinator)
🕒 10 credits [lecture: 60h, practical work: 60h] 📅 first term 🗨 English

MEMO-Y007 **Master Thesis**
🕒 20 credits [mfe/tfe: 240h] 📅 academic year 🗨 English

STAG-Y006 **Internship** | Yasser El Jasouli (Coordinator)
🕒 10 credits [work placement: 120h] 📅 academic year 🗨 French