SCIENCES, TECHNOLOGIES AND HEALTH

Cybersecurity

Master in Mathematics and applications

Duration
2 years

Component
Grenoble INP, Institut d'ingénierie et de management - UGA, UFR IM2AG (informatique, mathématiques et mathématiques appliquées)

Language(s) of instruction
English

Presentation

The global economic impact of losses due to cybercrime amounts to hundreds of billions of euros per year ($445 billion according to the McAfee/CSIS study of 2014) with a strong increase in attacks, especially for identity theft and digital data theft, as well as malicious attacks.

Protection against these vulnerabilities includes :

- Robustness to cyber attacks of sensitive infrastructure (e.g. stuxnet)
- Robustness of security components against software vulnerabilities and data leaks (e.g. heartbleed)
- Protection of privacy and security of cloud infrastructure
- Robust design and evaluation of safety components
- Fault detection in protocols or software and hardware components

The topics covered in the training cover the complementary areas of Cybersecurity, including cryptology, forensics, and privacy, in particular for embedded systems and distributed architecture.

The objective of this program is to train cybersecurity experts (including data privacy aspects) with a bac + 5 degree, able to evolve immediately in an industrial environment and who can also pursue a thesis.

International education : Internationally-oriented programmes

International dimension

Internationally oriented training

Organisation

Abroad intership : In France or abroad

Admission

Access conditions

The first year master's is accessible to candidates according to their transcripts (and/or interview) :

- Proof of a national degree conferring the degree of bachelor in a field compatible with that of the Master's degree- or by validation of studies or acquired experience according to the conditions determined by the university or the training

The second year master's is accessible to candidates according to their transcripts (and/or interview) :

- Having validated the first year of a compatible course (the course is accessible from the two common trunks General mathematics and Applied mathematics provided that the students have taken the appropriate optional courses)
- Or by validation of studies or acquired experience according to the conditions determined by the university or the training.

Public continuing education : You are in charge of continuing education :

- if you resume your studies after 2 years of interruption of studies
- or if you followed a formation under the regime formation continues one of the 2 preceding years
- or if you are an employee, job seeker, self-employed

If you do not have the diploma required to integrate the training, you can undertake a validation of personal and professional achievements (VAPP).

Candidature / Application

Do you want to apply and register? Note that the procedure differs depending on the degree considered, the degree obtained, or the place of residence for foreign students.

Find out which procedure applies to me and apply

And after

Further studies

Depending on the nature of their practicum, students may wish to pursue research in a doctoral thesis.

Professional integration statistics

In the 2014-2015 survey, 5 respondent graduates were in the labour market (employment+research). Of these, 80% were employed 30 months after graduation.

Targeted trades

- Cybersecurity engineer
- Information systems security engineer
- Engineer specialized in auditing security of information systems
- Technical sales engineer in computer security
- R & D engineer specialized in cybersecurity

Useful info

Contacts

Program director

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Course location(s) - City

Grenoble

Campus

Grenoble - University campus

Know more

Cybersecurity Course Site

http://cybersecurity.imag.fr/

Program

Master Industrial and applied math 1st year

Semester 7

	Nature	CM	TD	TP	Crédits
UE Partial differential equations and numerical methods	Teaching Unit (UE)	18h	18h	18h	6 credits
UE Signal and image processing	Teaching Unit (UE)		4,5h	16,5h	6 credits
UE Geometric modelling	Teaching Unit (UE)	16,5h	4,5h	33h	6 credits
UE French as a foreign language	Teaching Unit (UE)				
UE English	Teaching Unit (UE)				

Semester 8

	Nature	CM	TD	TP	Crédits
UE Computing science for big data and HPC	Teaching Unit (UE)			18h	6 credits
UE Project	Teaching Unit (UE)				3 credits
UE Internship	Teaching Unit (UE)				3 credits
UE Numerical optimisation	Teaching Unit (UE)			18h	6 credits
UE Computer algebra and cryptology	Teaching Unit (UE)			15h	6 credits
UE Variational methods applied to modelling	Teaching Unit (UE)	18h	18h	18h	6 credits
UE 3D Graphics	Teaching Unit (UE)	18h	18h		3 credits
UE Operations research	Teaching Unit (UE)	15h	18h	3h	3 credits

Master General mathematics 1st year

Semester 7

	Nature	CM	TD	TP	Crédits
UE Algebra 1	Teaching Unit (UE)	26h	45,5h		9 credits
UE Holomorphic functions	Teaching Unit (UE)	19,9h	29h		6 credits
UE Ordinary differential equations and partial differential equations	Teaching Unit (UE)				
UE Scientific English	Teaching Unit (UE)		24h		3 credits
UE Statistics	Teaching Unit (UE)				3 credits

Semester 8

	Nature	CM	TD	TP	Crédits
UE Study and research work	Teaching Unit (UE)		25h		3 credits
UE Algebra 2	Teaching Unit (UE)	19,5h	29h		6 credits
UE Differential and dynamic geometry	Teaching Unit (UE)	19,5h	29h		6 credits
UE Functional Analysis	Teaching Unit (UE)	19,5h	29h		6 credits
UE Stochastic processes	Teaching Unit (UE)	19,5h	29h		6 credits
UE Introduction to cryptology	Teaching Unit (UE)	15h	9h	9h	3 credits

Master 2nd year

Semester 9

	Nature	CM	TD	TP	Crédits
UE Software security, secure programming and computer forensics	Teaching Unit (UE)	19,5h		19,5h	3 credits

UE Security architecture : network, system, key management, cybersecurity of industrial IT	Teaching Unit (UE)	42h	15h	21h	6 credits
UE Cryptographic engineering, protocols and security models, data privacy, coding and applications	Teaching Unit (UE)	36h	21h	21h	6 credits
UE Threat and risk analysis, IT security audit and norms	Teaching Unit (UE)	19,5h		19,5h	3 credits
UE Physical Security : Embedded, Smart Card, Quantum & Biometrics	Teaching Unit (UE)	48h	15h	15h	6 credits
UE Advanced cryptology/Advanced Security	Teaching Unit (UE)	15h		24h	6 credits

Semester 10

	Nature	CM	TD	TP	Crédits
UE Research practicum (in company or laboratory)	Teaching Unit (UE)				30 credits