

UE Physical Security : Embedded, Smart Card, Quantum & Biometrics



Level
Baccalaureate
+5



ECTS
6 credits



Component
UFR IM2AG
(informatique,
mathématiques
et
mathématiques
appliquées)



Semester
Automne

- > **Start date:** Sep 21, 2016
- > **Teaching language(s):** English
- > **Teaching method:** In person
- > **Teaching type:** Lectures
- > **Open to exchange students:** Yes
- > **Code d'export Apogée:** GBX9SY05

Presentation

Description

Embedded systems: Principles of embedded systems design; smart cards, structure, and physical attacks; Design for Test and attacks on test structures; attacks through auxiliary channels; attacks by mistakes; countermeasures to the cited attacks.

Biometrics: objectives, fundamental principle, verification/authentication, various biometric modalities, examination of the most used modalities (fingerprint, facial recognition, iris) on the sensor side as well as on the algorithm side, the biometrics market, biometric performance evaluation (FAR & FRR), standardization, security of biometric systems (cryptography/vitality detection), introduction to encrypted biometry with cryptography (the grail of biometrics), protection of privacy, myths and realities.

Quantum: the postulates of quantum mechanics; how to use quantum information to make calculations, circuits and quantum algorithms; description of quantum information, density matrices, POVM measurements, fidelity, entropy; quantum error corrector codes; a bit of quantum communication complexity; use quantum information to make cryptography theoretically "secure", key exchange protocol BB84

Course parts

CM	Lectures (CM)	39h
TP	Practical work (TP)	21h
TD	Tutorials (TD)	18h

Recommended prerequisites

Cryptographic primitives, bases of numerical design, algorithms, bases of linear algebra

Period : Semester 9

Additional information

Autres intervenants : Charles GUILLEMET, Jean-François MAINGUET, Mehdi MHALLA

Useful info

Contacts

Program director

Paolo Maistri

✉ Paolo.Maistri@grenoble-inp.fr

Place

› Grenoble

Campus

› Grenoble - University campus