

Private Cryptocurrencies

ECTS : 3

Description du contenu de l'enseignement :

The first part of the course characterizes the long-standing project of creating an electronic cash system, analyzes the technical and institutional problems raised by its implementation, and reviews the proposed solutions leading up to Bitcoin. The second part examines the political motivations underlying the design of electronic cash systems.

Compétence à acquérir :

This course examines the origins and development of private cryptocurrencies. By the end of the course, students should be able to:

- Identify the key challenges involved in designing electronic cash systems (e.g., double-spending prevention).
- Describe the cryptographic mechanisms used to secure electronic payments (e.g., blind signature schemes).
- Explain the conditions that enabled the emergence of Bitcoin and subsequent alternatives (e.g., Ripple, Ethereum, ZCash).
- Assess and justify the design choices of different electronic cash systems.

Mode de contrôle des connaissances :

Quizz (40%) and oral presentation (60%).

Bibliographie, lectures recommandées :

- Brunton, F. (2019). *Digital Cash: The Unknown History of the Anarchists, Utopians, and Technologists Who Created Cryptocurrency*. Princeton University Press.
- Chaum, D. (1983). "Blind Signatures for Untraceable Payments." *Advances in Cryptology, Proc. Crypto '82*, D. Chaum, R. L. Rivest, & A. T. Sherman (eds.), Plenum Press, New York, pp. 199–203.
- Chaum, D. (1985). "Security Without Identification: Transaction Systems to Make Big Brother Obsolete." *Communications of the ACM*, 28, pp. 1030–1044.
- Nakamoto, S. (2008). "Bitcoin: A Peer-to-Peer Electronic Cash System."
<https://www.metzdowd.com/pipermail/cryptography/2008-October/014810.html>
- Turner, F. (2006). *From Counterculture to Cyberculture: Stewart Brand, the Whole Earth Network, and the Rise of Digital Utopianism*. University of Chicago Press.

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