



Course Syllabus

Course Code	Course Title	ECTS Credits
COMP-538DL	Blockchain Applications	10
Prerequisites	Department	Semester
None	Computer Science	Spring
Type of Course	Field	Language of Instruction
Required for Blockchain Technologies concentration	Computer Science	English
Level of Course	Lecturer(s)	Year of Study
2 nd Cycle	Prof. George Giaglis	1 st
Mode of Delivery	Work Placement	Corequisites
Distance Learning	N/A	None

Course Objectives:

The main objectives of the course are to:

- Critically discuss the main blockchain architectures (public, private, hybrid, cloud, etc.).
- Identify alternative distributed consensus mechanisms and comparatively evaluate them.
- Systematically analyze the horizontal and vertical application areas of blockchains, beyond digital currencies.
- Overview the landscape of existing blockchain services, including APIs, blockchain-as-a-service, industry consortia, etc.
- Discuss and analyze significant blockchain case studies and best-practice use cases.
- Discuss how blockchains, combined with other technological developments (IoT, AI, etc.), will disrupt the current status quo in money and commerce.

Learning Outcomes:

Upon completion of this course students are expected to be able to:

1. Demonstrate in-depth understanding of different blockchain types, architectures and distributed consensus methods.
2. Evaluate the potential of different blockchain types and distributed consensus methods in different use cases.
3. Critically appraise the potential of blockchain use in different application settings and

- scenarios.
4. Manage teams on blockchain application design and implementation.
 5. Envision the disruptive potential of blockchains in the field of money and commerce.

Course Content:

This course covers the following topics:

1. Blockchain Architectures: Public, Private, Hybrid.
2. Cloud-based blockchains, sidechains and semi-decentralized blockchains.
3. Alternative consensus mechanisms (PoW, PoS, etc.).
4. Blockchain applications: financial services, digital content storage and delivery, authentication and authorization, real estate, health, prediction, proof-of-existence, IoT, etc.
5. Blockchain case studies and best practices.
6. Implications of non-reversible transactional systems.
The future of money and commerce in a blockchain world: money-over-IP, machine-to-machine commerce, etc.

Learning Activities and Teaching Methods:

Teaching method consists of lectures, case studies, supervised labs and practical exercises (individual or team work), assignments, and coursework.

Assessment Methods:

Project and final examination.

Required Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Blockchain Revolution: How the Technology Behind Bitcoin Is Changing Money, Business and the World	Tapscott, D. and Tapscott, A.	Portfolio Penguin	2016	978-0241237854