

TEACHING GUIDE

COURSE DESCRIPTION

Subject Information	
Full Name	Blockchain Technology
Degree	Master in Finance
Code	0000012221
Term	3
Credits	3
Type	Elective
Taught in	Advantere School of Management
Area	Financial Markets
Professor Information	
Professor	
Name	Miguel Jaureguizar
CV	https://www.linkedin.com/in/migueljaureguizar/?locale=es_ES
Email	m.jaureguizar@advantere.org ; mjaureguizar@renta4.es
Office hours	Continuous availability via email

SPECIFIC SUBJECT INFORMATION

Objectives

After completing this course, the student will be able to explain what blockchain is, how it works, what types there are, why it is revolutionary and in which areas of the business world it can be applied. They will learn key concepts such as mining, hashing, proof of work, public key cryptography and the double-spending problem. The student will be able to describe seven design principles for blockchain technology and the challenges faced by the people developing it and will recognize the players in the blockchain ecosystem.

Subject contextualization

Contribution to the professional profile of the degree

Blockchain is a shared, immutable ledger that facilitates the process of recording transactions and tracking assets in a commercial network. An asset can be tangible (a house, a car, cash, land) or intangible (intellectual property, patents, stocks, investment funds, copyrights, trademarks). Virtually anything of value can be tracked and traded on a blockchain network, which reduces risk and lowers costs for everyone involved.

Blockchain is important because business is based on the exchange of information. The faster it is exchanged and the more accurate it is, the better. Blockchain is ideal for sharing that information because it provides immediate, shared and completely transparent information stored in an immutable ledger that can only be accessed by authorized members of the network.

A blockchain network can track orders, payments, accounts, production and more. And because members share a single view of what's happening, they can see all the details of a transaction from start to finish, giving them greater confidence, as well as new efficiencies and opportunities.

Blockchain technology has been developing over the last few years, especially thanks to the use case of cryptoassets. However, beyond cryptocurrencies such as Bitcoin, Ether or Cardano, this technology allows the development of other types of financial instruments: stablecoins, central bank digital money (CBDC) or traditional tokenized assets, for example.

Throughout this course we will review the essential elements of the technology in the context of traditional financial markets, the disruption generated in the back office and the effect on liquidity and industry building that asset tokenization has.

THEMES AND CONTENT

Contents-Themes
MODULE 1:
Theme 1: OPERATION OF CAPITAL MARKETS
1.1 Introduction 1.2 The main capital markets: equities, fixed income, foreign exchange and commodities 1.3 Derivatives and risk control
Topic 2: PRINCIPAL ELEMENTS OF BLOCKCHAIN TECHNOLOGY
2.1 Introduction: interaction of technology with regulation and business 2.2 How blockchain technology works at a high level 2.3 Parallels and implications in relation to the TCP/IP protocol 2.4 Internet of Information vs. Internet of Value
Topic 3: CRYPTO ASSETS AND DIGITAL ASSETS
3.1 Cryptocurrencies as cryptoassets 1.0 3.2 Economic reality of the main cryptocurrencies 3.3 Stablecoins, Central Bank Digital Currencies and Non-Fungible Tokens
Topic 4: TOKENIZATION AND SMART CONTRACTS
4.1 What is tokenization 4.2 How Smart Contracts work 4.3 Differences between centralized and decentralized markets 4.4 Introduction to DeFi and Web3 4.5 Example: tokenization of real estate assets 4.6 Example: tokenization of investment funds

Competences – Objectives

General

CG1: Project-based learning: Ability to develop and execute in its different phases collective financial projects based on real situations, proposing real solutions and making efficient all interactions with the team, clients and any other participants

RA1: Ability to engage in the development of experimental collective projects based in the real world, managing and aligning the client's needs with the available resources, optimally distributing the work, communicating and projecting its different phases, proposing real solutions and making efficient all interactions with the team, clients and other stakeholders

CGB 02: Critical thinking

CG10: Technical Capacity: Capacity for analysis, synthesis and projection, applied to situations, problems and models in the financial field

RA 1: Be able to deal with the analytical study of cases and scenarios, as well as to carry out synthesis of information and data

Specific

CE 05: Have an in-depth knowledge of the new business activities within the financial sector, as well as the value generation processes based on new technologies and their impact on the current and future financial ecosystem

RA4: Know the limitations of the Internet for business and economic activity, and how blockchain technology represents an alternative path

RA5: Know Big Data technologies, how their computer applications allow for predicting investor behavior or markets, as well as creating investment strategies, and how artificial intelligence, process automation and machine learning, allow optimizing those processes and making their predictions more efficient

CEOPT 1: Learn the model and operation of the digital banking business and the contributions of new technologies associated with this model, as well as the advantages and disadvantages compared to the traditional model

RA01: Know how to recognize and manage the main parameters, ratios and elements that determine the management of financial institutions, as well as the competitive and economic environment in which they operate

RA02: Know how to apply blockchain and digital banking concepts and processes to improve the management and efficiency of financial institutions

RA03: Know and know how to apply the new trends and paradigms that directly and indirectly impact the banking sector and Fintech

SUMMARY OF STUDENT WORK HOURS

PRESENTIAL HOURS					
Professor Exposition	Student exhibition. Debates and group dynamics	Exercises and problem solving. Elaboration of applied work	Analysis and documentation	Tutorial sessions	Development of real projects for organizations
5,5	13	10	0	1	0,5
NON-PRESENTIAL HOURS					
Professor Exposition	Student exhibition. Debates and group dynamics	Exercises and problem solving. Elaboration of applied work	Analysis and documentation	Tutorial sessions	Development of real projects for organizations
0	0	28,5	30	1	0,5

ECTS CREDITS: 3.0 (90.00 hours)

EVALUATION AND GRADING CRITERIA

Graded Activities	Evaluation Criteria	% of Total Grade
Assessment of individual or group work carried out by students, some of them presented in class	<ul style="list-style-type: none"> • Work adequacy to the objectives set • On-time delivery • Goal adequacy and focus • The participation of ALL members of each team in the presentations and elaborations is required 	50
Oral and written examinations, public defenses and multiple-choice tests, concept tests and case studies as exams	<ul style="list-style-type: none"> • Throughout the program, exams or written tests will be given to test the solidity of the concepts acquired. • In order to pass the course, the final exams and tests of each section of the course must be passed. If there are several exams in the same section or block of a course, the weighted average of them must be higher than 5.0 as a necessary condition to pass the course. 	30
Participation and utilization of the classes	<ul style="list-style-type: none"> • When we talk about participation, it is clear that both the positive and negative ones are counted and that the quality of participation is as important as the quantity. The students' participation in class, the quality and timeliness of their interventions, the quality in the preparation and presentation of their work, predisposition and commitment, initiative, attendance. 	20

Grades

The evaluation criteria of the subject are governed by the following regulations:

1. All students must comply with 100% attendance on the days set for this subject. Any absence must be justified.
2. The final grade corresponds to the sum of the graded activities, evaluation criteria and % of total grade described in the Evaluation and Grading Criteria section.
3. Individual and group work must be delivered on time and in the manner planned by the subject professor.
4. A final mark below 5 implies the completion of an extraordinary test. The final grade in this exam may not be higher than the median of those passed at the time of set exams.

The Evaluation Criteria to enroll for a second year

The student enrolled in the subject for the second year must comply with the individual and group tasks set by the subject professor. The same evaluation criteria described in the Evaluation and Grading Criteria section will be maintained.

For those circumstances not foreseen in this Teaching Guide, the Advantere School of Management Regulations and the Comillas General Regulations will apply.

Health alert criteria:

Students must be permanently identified, in class with an identification sign and remotely with their full name. Students should not change the spaces they occupy in the classroom, until a professor or the program management indicates they can do so.

Failure to comply with any of the health recommendations during class sessions may result in failure of the course

BIBLIOGRAPHIES AND RESOURCES

Basic Bibliographies
Text Books
<ol style="list-style-type: none">1. LEWIS, A. (2018). The basics of bitcoins and blockchains: an introduction to cryptocurrencies and the technology that powers them.2. NAKAMOTO, S., & CHAMPAGNE, P. C. (2014). The book of Satoshi: the collected writings of Bitcoin creator Satoshi Nakamoto3. TAPSCOTT, D., & TAPSCOTT, A. (2018). Blockchain revolution: how the technology behind bitcoin and other cryptocurrencies is changing the world4. ELROM, E. (2019). The Blockchain Developer A Practical Guide for Designing, Implementing, Publishing, Testing, and Securing Distributed Blockchain-based Projects. Berkeley, CA, Apress.5. TATAR, J. (2017). Cryptoassets. [S.l.], McGraw-Hill Education.6. BITCOING.ORG. (2019). Bitcoin: a Peer-to-Peer Electronic Cash System.
Other readings
Web pages
Additional Bibliographies
Articles

