Syllabus
Course description

Course title	**Big Data and Blockchain**
Course code	**25418**
Scientific sector	ING-INF/05
Degree	LM 77 Master in Accounting and Finance
Semester and academic year	2nd semester 2022-2023
Year	1
Credits	3
Modular	No

Short Description	This is a programming course particularly focused on the handling and analysis of financial big data. The first part of the course focuses on using Python's package pandas to get, analyse and extract information from large amounts of financial data. The course is strongly focused on practise, consisting in very short theoretical sessions followed by several examples, exercises and homework. An overview of blockchain technology, decentralised finance and a practical experience with smart contracts on Ethereum blockchain are introduced for their innovative potentialities as well as an example of big data to be analysed. This course gives future professionals in the fintech industry the fundamental skills in this sector, which can be further expanded building on the basis learnt here. To professionals in other industries it offers skills which extend their understanding of the structure and potential use of large datasets and new technologies.
Total lecturing hours	24
Total lab hours	0
Total exercise hours	0
Attendance	A continuous and regular attendance is suggested, but not required. Intermittent attendance is strongly discouraged: for non-attending students additional video material which covers the entire course is available.
Prerequisites	English understanding and reading at level B2. A basic course in computer science covering basic Microsoft Windows, file handling, Internet usage, Excel or a similar data organization program at good level. Basic descriptive statistics and basic finance knowledge.
Course page	www.paolocoletti.it/bigdata

Specific educational objectives	The course is designed to acquire data analysis skill fundamental for the fintech sector and useful even in other sectors. An overview of current blockchain

	technology, in particular for decentralised finance, complements the course.

Lecturer	Paolo Coletti Office E 203 Paolo.Coletti@unibz.it www.paolocoletti.it
Scientific sector of the lecturer	ING-INF/05
Teaching language	English
Office hours	please refer to the lecturer's timetable
Lecturing assistant	none
Teaching assistant	To be determined
Office hours	9
List of topics covered	Pandas for Python, financial analysis. Blockchain and cryptocurrencies Smart contracts on Ethereum blockchain.
Teaching format	Frontal lectures in standard classroom with examples and exercises. Students attend with their own notebook or a computer borrowed from the library. Homework is assigned at every lesson and will be corrected in the next one.

Learning outcomes	Knowledge and understanding • knowledge and understanding of data structures for financial, macro-economic and market data • knowledge and understanding of algorithms for analysing large amount of data in real time • understanding of technical problems when working with big data • basic knowledge and understanding of potential uses of smart contracts on blockchain Applying knowledge and understanding • ability to organize and restructure accounting, financial, organizational, economic and market data • ability to use analysis tools to predict trends in financial markets or to perform quantitative analysis of organizational data Making judgments • ability to choose the adequate tools or techniques when dealing with big data • ability to observe and evaluate graphical and statistical representations without being misled • ability to determine the difficulty level for data handling

	Communication skills
	• ability to communicate efficiently the results of data analyses through graphical representations Learning skills • ability to use online help systems to further expand program usage

Assessment	1. Written assessment on blockchain technology 2. Practical assessment on Python programming for finance 3. Practical assessment on smart contracts development. As optional replacement for practical assessments 2 and 3, constant assignments and midterms to test student's skills.
Assessment language	English
Evaluation criteria and criteria for awarding marks	Grade is the weighted average of the assessments. File handling and severe basic computer errors count negatively on the final grade. Particular emphasis is given to solutions which are optimal, efficient, versatile and extensible. Active contributions to the course in class or via email count positively towards the final grade.

Required readings	• Videos on Python programming for finance, available on www.paolocoletti.it/bigdata • Videos on blockchain technology, available on www.paolocoletti.it/bigdata • Videos on smart contracts development, available on www.paolocoletti.it/bigdata
Supplementary readings	