Freie Universität Bozen
Libera Università di Bolzano
Università Liedia de Bulsan

Syllabus
Course description

Course title	**Data Analytics, 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 2019-2020
Year	1
Credits	3
Modular	No

Short Description	This is a programming course particularly focused on the handling and analysis of financial big data. Starting from the very basics of Python programming the students will get to learn the techniques for dealing with large amounts of data, efficient algorithms and data structures. 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 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.
Total lecturing hours	36
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 programming skill fundamental for the fintech sector and useful even in

	other sectors. An overview of current blockchain technology complements the course.

Lecturer	Paolo Coletti Office E 203 Paolo.Colettinibz.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	none
Office hours	18
List of topics covered	Basic Python programming, algorithms and data structures for machine learning and big data. Blockchain and cryptocurrencies Smart contracts on Ethereum blockchain.
Teaching format	Frontal lectures in standard classroom with examples and exercises. Students use their own notebook or a computer borrowed from the library and then repeat the lesson at home with the help of provided videos and do home exercises, to be repeated in class in front of the colleagues.

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 summarize and communicate data efficiently • 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 3. Practical assessment on smart contracts development. As optional replacement for practical assessments, constant coursework and midterm 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 and extensible. Active contributions to the course in class or via email count positively towards the final grade.

Required readings	• Videos on Python programming, 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 • Data analysis course book, available on www.paolocoletti.it/bigdata
Supplementary readings	• Infographics course book, available on www.paolocoletti.it/bigdata