Syllabus

Course Description

Course Title	Financial Trading and Algorithms
Course Code	76424
Course Title Additional	
Scientific-Disciplinary Sector	ING-INF/05
Language	Italian
Degree Course	Bachelor in Informatics and Management of Digital Business
Other Degree Courses (Loaned)	
Lecturers	Dr. Paolo Coletti, Paolo.Coletti@unibz.it https://www.unibz.it/en/faculties/economics-management/academic-staff/person/6359
Teaching Assistant	
Semester	First semester
Course Year/s	3
CP	6
Teaching Hours	42
Lab Hours	0
Individual Study Hours	108
Planned Office Hours	
Contents Summary	• Market economics and finance • Trading on electronic markets • Automated short-term trading strategies • Smart contracts and blockchain financial applications
Course Topics	Markets: Economics and Finance – introduces the rules, micro-structure, and technical aspects of financial markets. Trading on Electronic Markets – covers trading strategies based on analytical, heuristic, or statistical models. Automated Short-Term Trading Strategies – students develop strategies and algorithms to detect trading signals efficiently and

	rapidly. Financial Applications of Blockchain – introduces cryptocurrencies, blockchain technology, and the development of smart contracts on the Ethereum blockchain.
Keywords	financial markets, trading, blockchain, smart contract
Recommended Prerequisites	Programming, the main algorithms and computer date structures.
Propaedeutic Courses	
Teaching Format	Lectures, classroom examples, homework, homework discussion, student presentation.
Mandatory Attendance	Attendance is optional. All students have the option of skipping part of the examination by means of a test.
Specific Educational Objectives and Learning Outcomes	The course is part of the attività formative affini o integrative. The course provides knowledge about the microstructure of financial markets, focusing in particular on technical aspects and trading algorithms. It gives the student the professional skills to work as a developer of automated trading algorithms. The last part of the course gives an insight into the current state of the art on blockchain technology, focusing on the development of smart contracts for the purpose of developing an automated exchange. Knowledge and Understanding D1.17 – Knowledge of additional Digital Finance methods and their application. D1.18 – Understanding of the interdisciplinary approach to IT projects, taking into account technical foundations, business needs, social and dynamic aspects, as well as the regulatory framework. Applying Knowledge and Understanding D2.3 – Ability to analyze business problems and develop solution proposals using information technology tools. D2.4 – Ability to formalize and analyze procedures and operational processes, and to identify and leverage optimization potentials. D2.6 – Ability to design, describe, and present IT solutions to decision-makers. D2.9 – Ability to support the management of IT departments and

	software companies by providing information based on specific needs. D2.11 – Ability to analyze large volumes of data on economic facts and processes. D2.13 – Ability to apply additional knowledge in the field of Digital Finance. D2.18 – Ability to communicate with clients in both written and spoken Italian at a professional level. Making Judgements D3.1 – Ability to collect and interpret data to form independent judgements on IT and economic aspects of information systems. D3.3 – Ability to compare and evaluate different IT solutions based on their technical characteristics and key business stakeholders. D3.4 – Ability to assess essential economic and business events based on numerical data. Communication Skills D4.1 – Ability to use three languages with technical terminology and an appropriate communication style. D4.2 – Ability to use modern means of communication, including remote interactions. D4.3 – Ability to negotiate with individuals from different professional backgrounds regarding the definition and requirements of business information systems. Learning Skills D5.2 – Learning ability to carry out strategic and IT-related project activities within business communities, including distributed ones. D5.3 – Ability to keep pace with rapid technological change and to learn emerging aspects of the field.
Specific Educational Objectives and Learning Outcomes (additional info.)	
Assessment	Students are assessed through a final examination consisting of programming exercises and a written test on the theoretical

	material. A portion of the final exam may be replaced by a mid-term test, provided the student passes it.
Evaluation Criteria	The final grade is calculated as 25% for the exam on the theoretical parts and 75% for the programming exercises. The weights may vary depending on the number of lecture hours dedicated to each part.
	In the evaluation of programming exercises and projects, particular emphasis will be placed on clarity, computational efficiency, and versatility.
Required Readings	No textbooks are used. For all lectures, a video is provided by the instructor prior to the class.
	Subject librarian: David Gebhardi, David.Gebhardi@unibz.it
Supplementary Readings	
Further Information	Software used: For the first part, Python will be used with Anaconda and Jupyter, although students may use their preferred IDE, such as the web-based Colab. For the second part, Solidity will be used with the web-based software Metamask and Remix as the IDE, although students may choose a different IDE if they prefer.
Sustainable Development Goals (SDGs)	Quality education