LUISS

University - Rome

Frontiers In Finance:
Cryptocurrency, Machine Learning And Esg Investing
Summer Program - 2024

General Information

- Credits: 4 ECTS (one-week program)
- Hours: 28
- Academic Coordinator: Federico Carlo Eugenio Carlini
- Dates: 24-28 June 2024

- Price: €1290 without accommodation
  €1690 with accommodation

Course Description

This course presents students topics at the **current frontier of Finance** and aims to introduce the challenges that financial markets are facing in relation to rapid **technological and environmental changes**.

The first part of the course focuses on topics related to **Digital Innovation in Finance,** and specifically blockchain, cryptocurrency and decentralized finance.
The second part of the course centers on **Sustainability in Finance,** with a special focus on the implications in investing and ESG ratings.
The third part of the course is devoted to **Machine Learning with applications to Finance based on Python**.

1. Cryptocurrency and blockchain
Introduction to blockchain
Bitcoin and cryptocurrencies
Decentralized Finance
Web3 Markets
DAOs
2. ESG Investing
ESG rating
ESG investing and sustainability
ESG regulation and investment strategies
ESG portfolios
3. Python for Finance
Introduction to Python
Data analysis
Scientific computation
Portfolios construction
Risk Management
4. Machine Learning for Finance
Linear Model
Ridge Regression
LASSO
Application

Course Prerequisites

Basic training in Economics and Finance

Course Objectives and Learning Outcomes

At the end of the course, students will be able to:

I   understand the most recent challenges to Finance and financial markets;
I   apply machine learning techniques to investing;
I   understand the ESG characteristics of a financial portfolio.

Course Grading

Grading of the two-week program is based on a number of components weighted as follows:

I   80% exam
I   20% class participation

Luiss University does not offer mere Pass/Fail grades or Incompletes, but the following grading system is applied:

Luiss grades	Definition	US grading system*
30 e lode	Excellent	A+
30	Excellent	A
29	Very good	A-
28	Good	B+
27	Good	B
26		B-
25	Satisfactory	C+
24		C
23		C-
22	Pass	D+
21	Pass	D
20/19/18		D-
<18	Fail	F

*Students are responsible for understanding the Luiss University grading system and their home institution's minimum grade requirement for the transfer of credit. Please note that only grades equal to or greater than 18 will be recorded and reported on the official transcript. Students who obtain a final grade of less than 18 (F) will receive a declaration, issued by the Summer University Office, reporting that outcome.

Student Assessment

I   Students will be assessed through an open-book written exam, to be held remotely. The exam will be at the end of the week.
I   The exam will consist of one or more short essays or open questions plus, possibly, 1 problem set concerning the main topics of the course.
I   The use of proper grammar and sentence structure, correct spelling as well as appropriate language and terminology will have a significant impact on the grade.
I   The exam dates CANNOT be changed for any reason, so students must organize their personal schedule accordingly.
I   NB: Students with learning disabilities who may need special provisions during exams are required to contact Luiss Summer University staff beforehand.

Class Participation

Speaking up in class will be highly encouraged and welcomed. It will be expected that students actively listen to their classmates, pay attention and participate in the class through reading assignments, doing homework and contributing to the overall class environment.

Students will be evaluated based on their ability to understand and apply all acquired knowledge to class/team discussions. Each student will be expected to provide opinions and feedback, and to challenge the instructor's and other students' assumptions in a respectful manner. A correct, active and responsible participation is highly recommended as otherwise the final grade will be strongly affected.

Leaving class for no reason and disrupting it (i.e. talking, texting, etc.) will impact the final grade.

Teaching Methodology

The lessons will reflect a multi-methodological approach, consisting of:

▌ a balanced combination of various teaching techniques including lectures and open discussions in the virtual class;
▌ class sessions based on lectures with in-class slides introducing students the specific topics and incorporating discussions with practical examples and, possibly, teamwork activities.

Course readings/resources

Learning materials will be provided in class for free. Buying books or any other teaching materials is not compulsory. All lectures include a perfect blend of theoretical and applied knowledge of the field, case histories and insights from the most recent geopolitical and economic events.

Advance readings (recommended):

▌ Auer, B.R. and Schumacher, F. 2016, Do socially (ir)responsible investment pay? New evidence from international ESG data, Quarterly Review of Economics and Finance.

▌ Buterin, V., 2014, Ethereum White Paper.

▌ Halbritter, G. and Dorfleitner, G. , 2015, The wages of social responsibility – where are they? A critical review of ESG investing, Review of Financial Economics.

▌ Hilpisch, Python for Finance, 2019, O'Reilly

▌ James, G., Witten, D., Hastie, T., et al., 2023, An Introduction to Statistical Learning: with Applications in Python, Springer Cham.

▌ Nakamoto, S., 2009, Bitcoin White Paper.

Course Schedule

Students should bear in mind that the contents of individual lessons may change slightly depending on the progress of the class.

	Content/Topic	Activities	Notes
Day 1	CRYPTOCURRENCY AND BLOCKCHAIN Prof. Michele Favilla	Deep dive into Web 3. Decentralization and the future of Web3.	From the basics of blockchain to its most advanced applications.
Day 2	ESG INVESTING Prof. Kevyn Stefanelli	Introduction of Sustainable and Development Goals	Overview, Regulation, Ratings, Investment strategies.
Day 3	PYTHON FOR FINANCE Prof. Francesco Morelli	Introduction to Python Programming with financial applications.	Programming language, Python, Portfolios, Risk Management.
Day 4	MACHINE LEARNING FOR FINANCE Prof. Alessia Caponera	Introduction to Machine Learning applied to Finance	Linear models and regularization methods with application in Finance.
Day 5	FINAL EXAM Prof. Federico Carlo Eugenio Carlini	Lecture, participation and discussion	

Names of the instructors: Michele Favilla, Kevyn Stefanelli, Francesco Morelli and Alessia Caponera.

NB: Should the instructor be unavailable, a substitute will give the scheduled or a prepared alternative lecture at the regular class time.

Luiss Course Policies

Attendance Rules

l   In order to be allowed to take the exam and to obtain the course attendance certificate, students must attend at least 90% of the hours of lessons and activities set out in the course syllabus.
l   Attendance is counted on a weekly basis.
l   Punctuality is mandatory. Students must arrive in class on time: any lateness, leaving class during the lesson without notice, not showing up on time after the break or leaving early will impact the attendance percentage.
l   Students are responsible for keeping track of their absences and for catching up on any missed work.

- Make-up classes are always mandatory as part of the course program.
- For no reason (i.e. religious holidays, travel plans, family matters, etc.) will absences be excused.
- Students will receive an "F" on each exam they miss.
- Students who leave Luiss University before the end of the course that they are enrolled in must fill out an Official Withdrawal Request form and return it to Luiss Summer University Office. Students are allowed to withdraw from the courses up to the day before the weekly exam and they will receive an official withdrawal declaration. Students who leave Luiss University without submitting the form will receive an "F" in each non-completed course. In all cases, students will not be eligible for credits nor receive a refund.
- Students who do not attend more than 10% of hours of lessons and activities set out in the course syllabus will have no credits awarded and, without signing the Official Withdrawal Request Form, will receive an "F" as their final grade.

NB: The onus is on the students themselves to catch up on any missed work and to keep track of their absences/lateness.

Assignment Submissions

Late submissions of assignments, including papers, are not accepted. If an assignment is submitted after the deadline, the grade for the assignment will be an "F" (0 points), which may adversely impact the final grade of the course.

Scheduling Conflict

If, on occasion, a class has a scheduling conflict with another class (due to a simultaneously scheduled make- up class, site visit, etc.), the student is required to inform both instructors in advance, allowing them to prepare a formal justification for the class that will be missed. Even though an absence may be excused, students must be aware that there is no possibility of making up any assessed in-class activities they may have missed and no refund will be given for pre-paid visits/field trips.

Etiquette

- No eating or drinking is allowed in museums. In religious places, shoulders and knees must be covered.
- Classrooms are to be left neat and clean. Students must take proper care of available equipment and materials and promptly report any damage or loss.
- Eating or drinking during class/site visits is not allowed. Electronic devices (cell phones, smartphones, iPods, iPads, laptops, etc.) must be switched off during class, unless otherwise instructed.
- Students' behavior must be informed by the principles of dignity, decorum and respect.
- Students must dress in a sober and dignified manner on university premises, keeping in mind that they are in an academic institution.

NB: Instructors who find that a student's behavior is inappropriate will seek to talk to him/her immediately. If the behavior continues, the instructor is required to contact the appropriate Luiss authorities.

Academic Honesty

All student work will be checked for plagiarism.

According to the Luiss Summer University Code of Conduct, "Violations include cheating on tests, plagiarism (taking words or texts, works of art, designs, etc., and presenting them as one's own), inadequate citation, recycled work, unauthorized assistance or similar actions not explicitly mentioned". Assignments and projects are specific to individual courses. Therefore, presenting the same work in two different courses (including previous courses) is considered recycling and is unacceptable.

Why is plagiarism bad?

- It is unethical.
- The student will fail the assignment and possibly the course.
- Faculty are required to report it.
- The student will be put on academic probation.
- The student might even be dismissed from college.

Bottom Line: Students MUST cite the sources that they use!

NB: Should issues on academic dishonesty arise, the faculty members will adhere to the relevant Luiss policy and report any suspected cases to the Luiss Course Leader for disciplinary review.

Useful Student Resources

Internal Luiss Resources

The Luiss Library offers its users a wide collection of both printed and online periodicals. To see the database of e-journals currently available, users can consult the dedicated page.

The Luiss Library has subscriptions to a number of databases, organized by:
- subject
- type
- remote access

Important research libraries in Italy

Biblioteca di Palazzo Venezia, Biblioteca Nazionale, Fondo Marciano di Venezia, Biblioteche di Firenze and Biblioteca Vaticana.

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