Robo-Investing

Department: Fudan International Summer Session 2025

Course Code						
Course Title	Robo-Investing					
Credit		Experiment (Including Computer) Credit		Practice Credit		Aesthetic Education Credit	
Credit Hours Per Week	9 credit hours per week, 36+3 tutorial hours in total (one credit hour is 45 minutes)	Education on The Hard-Working Spirit Credit Hours		**Language of Instruction**	English	Honors Course	□Yes □No

Course Type	□Core General Education Course □Specific General Education Course □Basic Course in General Discipline ☑Others	2+X Major ： □Professional Core Course X Professional Advanced Course
		Non 2+X Major ： □Professional Compulsory Course □**Professional Elective Course**

Course Objectives	The course objectives for Robo-investing can be categorized into value, knowledge, and ability objectives:
	
	   1. Value Objectives
	Appreciate the role of technology in transforming wealth management, emphasizing the ethical, innovative, and practical benefits of automation in finance.
	Promote the importance of personalized investing, highlighting how big data and robo-advisors enhance individual client outcomes and corporate strategies.
	Encourage a forward-looking perspective, preparing students to adapt to and embrace future advancements in financial technology.
	   2. Knowledge Objectives	

	Comprehend key financial technologies, including algorithmic trading, robo-advisors, artificial intelligence, big data, and IoT applications in wealth management. Understand the principles of asset allocation and diversification, focusing on their role in building balanced investment portfolios. Gain insights into portfolio risk metrics, learning how to evaluate and manage risks aligned with clients' preferences and goals. Explore the application of IoT data in finance, understanding how IoT-driven insights can optimize investment decisions and strategies. 3. Ability Objectives Apply automated tools and algorithms to create and manage investment portfolios tailored to individual and corporate client needs. Leverage big data to design and implement personalized wealth management strategies effectively. Analyze and assess investment risks, using quantitative and algorithmic approaches to align risk management practices with client objectives. Utilize IoT data in investment decision-making, integrating innovative data sources to enhance financial strategy development.
Course Description	This is an advanced course designed to provide students and professionals with a deep understanding of how financial technology is reshaping the landscape of wealth management. The course explores key innovations, including robo-advisors, algorithmic trading, artificial intelligence, big data analytics, and the Internet of Things (IoT), and their applications in personal and corporate investing. Through a balanced mix of theoretical frameworks and practical case studies, students will learn essential principles such as asset allocation, portfolio diversification, and risk management, while gaining hands-on experience in applying advanced data analytics to develop personalized investment strategies. The curriculum emphasizes the growing importance of automation and personalization in wealth management, equipping students with the skills to leverage large datasets, assess portfolio risks, and integrate IoT data into financial decision-making. By the end of the course, students will have the foundational knowledge, analytical tools, and technical expertise to navigate and succeed in the evolving world of automated wealth management, addressing the needs of both individual investors and corporate clients in a dynamic, technology-driven market.
Course Requirements: knowledge in finance	
Teaching Methods: 1. Lectures 2. Case study analysis 3. Project based learning	

Course Director's Academic Background: Dr. Darko B. Vukovic is GSOM Chief Expert (Scientific director) in the International Laboratory „Research center for Market efficiency and applied finance", over 15 years of experience teaching finance courses at the postgraduate, graduate (master in corporate finance, CFA, ACCA, AMBA, AACSB accreditations), and undergraduate level at, Saint Petersburg University. Dr. Vukovic also serves as the Head of the International Laboratory for Finance and Financial Markets at Faculty of Economics, People's Friendship University of Russia, in Moscow, Russia, an as a Full professor of Belgrade Banking Academy, Belgrade, Serbia.

The research interest of Dr. Vukovic is in digital finance, financial markets, financial forecasting, machine learning in finance, financial risk management and investment finance. In 2017, he received Honorary Doctor of Excellence, honoris causa (Excellentia Doctor), from CIAC - Confederation of International Accreditation Commission. His research has been awarded multiple times, like the Emerald Literati Award 2021 for "Outstanding Paper", UK and from publisher Wiley, Top Cited Article in 2020-2021 (the journal Internet technology letters). In 2023, Dr. Vukovic is rewarded for Top Downloaded Article, from publisher Wiley (published in the journal Software: Practice and Experience – Advanced data integration in banking, financial, and insurance software in the age of COVID-19). He has published more than 85 papers indexed in leading index databases: Web of Science, Scopus and ABS (CABS), including leading journals in the field of finance and financial forecasting (Journal of International Money and Finance, International Review of Financial Analysis, Emerging Markets Review, Finance Research Letters, Expert Systems with Applications, Financial Innovations, Physica A: Statistical Mechanics and its Applications, Research in International Business and Finance, International Journal of Finance and Economics, North American Journal of Economics and Finance, and more). During his career, he has reviewed numerous journals of leading publishing houses (Tayler & Francis, Elsevier, Springer, Chapman & Hall/CRC Press, Emerald, Sage, etc.) and has been several times a guest editor in international journals. He is Editor-In-Chief of Springer book- Digitalization and the Future of Financial Services, Springer (Nature). Prof. Vukovic is a member of The American Southern Finance Association (Jacksonville, US) and Southwestern Finance Association (Huston, US).

Instructor's Academic Background: Please rerefer to Course Director's Academic Background!

Members of Teaching Team

Name	Gender	Professional Title	Department	Responsibility
Darko Vukovic	Male	Prof. in finance, Scientific director	Research center for market efficiency and applied finance, Graduate School of Management, Saint	Chief expert and professor

			Petersburg State University.	

Course Schedule (Please supply the details about each lesson)**:**

Unit 1: Introduction to robo-investing

1.1 What is robo-investing?
- Definition and overview of robo-advisors
- Key technologies behind robo-advisors
- The growing role of automation in wealth management
1.2 Why robo-investing?
- Benefits for individual and corporate investors
- Accessibility, cost-efficiency, and data-driven decisions
1.3 Actuality of studying robo-investing
- Equipping students with skills in fintech and algorithm-based investment strategies
- Understanding wealth management automation for individuals and corporations
1.4 Case study: The rise of Wealthfront and Betterment (how personal robo-advisors transformed wealth management)

Unit 2: Financial technologies running robo-investing
2.1 Core fintech technologies
- Algorithmic trading for individuals and institutions
- Digital wallets and financial platforms
- Automation and artificial intelligence in wealth management
2.2 Robo-advisors: personal vs. corporate
- Features of robo-advisors for personal wealth
- Corporate robo-advisors for institutional investors
2.3 Case study: Vanguard's hybrid model (a fusion of robo-advisors and human advisors in wealth management), or Renaissance Technologies (one of the world's most successful hedge funds), PayPal, Robinhood (a commission-free trading platform, integration of both a digital wallet and investment platform)

Unit 3: Asset allocation and diversification
3.1 Understanding asset allocation
- How asset allocation works for personal and corporate portfolios
- Risk and return balancing through robo-advisors
3.2 Diversification strategies
- Algorithm-based diversification for individuals and corporations

- Using robo-advisors for automated portfolio optimization

3.3 Case study: Betterment's asset allocation model (how betterment uses algorithms to balance portfolios for clients), Wealthfront, BlackRock's Aladdin (platform which helps corporate clients, including pension funds and sovereign wealth funds to allocate capital efficiently across global assets), etc.

Unit 4: Wealth management with robo-advisors

4.1 Wealth management for individuals

- Automating personal financial planning

- Features like tax-loss harvesting and long-term investment goals

4.2 Corporate wealth management automation

- Streamlining corporate asset management

- How robo-advisors help manage complex corporate portfolios

4.3 Client engagement and trust

- Building client trust in robo-advisors for both personal and corporate investors

4.4 Case study: Charles Schwab intelligent portfolios (the use of robo-advisors in both personal and corporate wealth management), Path tool (helps users plan for major financial goals like retirement, homeownership, and education funding), BlackRock's Aladdin (platform with a comprehensive risk management and asset allocation tool used by corporations, pension funds, and institutional investors), UBS SmartWealth (one of the early robo-advisor platforms tailored for corporate clients).

Unit 5: Big data and personalization in robo-investing

5.1 Big data's role in investment strategies

- How big data drives personal and corporate robo-advising

- Tailoring investment solutions based on data analytics

5.2 Personalized investment strategies

- Customizing investments for individual clients

- Adapting corporate investment approaches using data insights

5.3 AI and machine learning in personalization

- AI-driven insights for personalized wealth management

5.4 Case study: Acorns and big data in micro-investing (how acorns use data to create personalized investment plans), UBS Evidence Lab (a unique initiative that uses data-driven insights to guide investment strategies for corporate clients), Ellevest (a robo-advisor focused on female investors), and similar

Unit 6: Portfolio risk assessment

6.1 Understanding investment risk

- Risk metrics for personal and corporate portfolios

- Assessing risk tolerance and adjusting investments

6.2 Risk management through algorithms

- How robo-advisors handle risk for individuals and institutions

6.3 Real-time risk monitoring and adjustments

- Using data and AI to mitigate risk across portfolios

6.4 Case study: Blackrock's Aladdin risk management system (advanced risk management techniques for institutional and corporate clients), Betterment's risk-level allocation, Wealthfront's risk tolerance questionnaire, Schwab intelligent portfolios for corporate clients

Unit 7: IoT data applications in robo-investing

7.1 Introduction to IoT in finance

- How IoT data is changing investment strategies
- Examples of IoT data use in personal and corporate wealth management

7.2 IoT for real-time investment decisions

- Leveraging IoT data for smarter financial planning
- Corporate and institutional use of IoT insights for asset management

7.3 Future applications of IoT in robo-advising

- Emerging IoT -driven strategies for both individuals and businesses

7.4 Case study: IoT -driven investment insights by Kensho (how Kensho uses data from various sources to make investment decisions), IBM's Watson IoT platform (how uses data collected from sensors, mobile devices, and wearables to provide predictive insights), Goldman Sachs and IoT for real-time market monitoring, etc.

Unit 8: The future of robo-investing

8.1 Technological trends in robo-advising

- AI, blockchain, and quantum computing in wealth management
- The role of predictive analytics in future investment models

8.2 Challenges and opportunities

- Ethical and regulatory challenges in fintech
- Opportunities for growth in personal and corporate wealth management

8.3 Meeting the future

- Skills needed to navigate the evolving fintech landscape
- How individuals and businesses can leverage robo-investors

The design of class discussion or exercise, practice, experience and so on:

Class Discussion

Topic-Driven Debates

Design: Assign specific topics (e.g., ethical implications of AI in investing, limitations of algorithmic trading) for group debates.

Objective: Encourage critical thinking and allow students to articulate diverse perspectives.

Format: Split the class into teams to present arguments and counterarguments, followed by open discussion.

Current Trends Analysis

Design: Use recent fintech news or industry reports to spark discussion on emerging technologies.

Objective: Connect theory to real-world developments, fostering industry awareness.

Format: Students prepare insights on assigned articles or reports and lead discussions.

Practice

Building a Personalized Investment Strategy

Design: Students analyze sample client data (risk tolerance, financial goals) to create tailored strategies using big data tools.

Objective: Develop proficiency in data-driven wealth management.

Format: Individual assignments with peer feedback and instructor guidance.

Risk Assessment Workshop

Design: Provide sample portfolios with varying risk profiles and ask students to evaluate and propose adjustments.

Objective: Teach portfolio risk assessment and risk mitigation techniques.

Format: Hands-on practice with instructor feedback.

If you need a TA, please indicate the assignment of assistant: Yes.

General announcement to students.

Collection of students' projects/assignments and submission to the course instructor.

Assistance with the FSE system.

Grading & Evaluation (Provide a final grade that reflects the formative evaluation process)**:**

Control forms	Weight in the course grade
In-group project	50%
Attendance and active participation in classes	10%
Final exam	40%
Total	100%

Usage of Textbook：X Yes (complete textbook information form below)   □No

Textbook Information (No more than two textbooks) **:**

Title	Author	ISBN	Publishing Time	Publisher	Type I	Type II
Robo-Investing: A Comprehensive Guide to Automated Wealth Manag	Vukovic, D., & Maiti, M.		June 2025	Springer-Nature	**X** Self-compiled Textbook (Published) □Non-mainland Textbook □Other Textbook (Published)	□National Planning Textbook □Provincial and Ministerial Planning Textbook □School Level Planning Textbook □Others

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Teaching References (Including author, title, publisher, publishing time,ISBN)**:**

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