

FinTech and Big data Management in Cashless Society

Department: Fudan International Summer Session

Date:

Course Code	ECON130283						
Course Title	Overseas Lecturers' Short Courses III 海外学者专题 III (Note: Topic for 2023: FinTech and Big data Management in Cashless Society)						
Credit	2	Experiment (including Computer) Credit	0	Practice Credit	0	Aesthetic Education Credit	0
Credit Hours Per Week	18	Education on The Hard-Working Spirit Credit Hours	0	Language of Instruction	Engl ish	Honors Course	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Course Type	<input type="checkbox"/> Core General Education Course <input type="checkbox"/> Specific General Education Course <input type="checkbox"/> Basic Course in General Discipline <input type="checkbox"/> Others			2+X Major :			
				<input type="checkbox"/> Professional Core Course <input checked="" type="checkbox"/> Professional Advanced Course			
			Non 2+X Major :				
			<input type="checkbox"/> Professional Compulsory Course <input type="checkbox"/> Professional Elective Course				
Course Objectives	The main goal of the course is to provide graduate students with advanced knowledge and skills in new financial technologies and its structure, applying its instruments and tools in core business processes, problem solving and corporate funding. The aim is also to give the experience and practical skills in new fintech, applying in real business situation and practical realization. The additional focus is on the use of big data in personalized wealth management and asset management, portfolio risk assessment, as well as variety of novel usage-based Insurance applications based on Internet-of-Things data.						
Course Description	This course has special attention on cashless market based on the use of the modern technologies in finance. The students will also learn the trend of transformation of the corporate system into Hyperledger, Ethereum or Corda networks, as a new model of business organization by applying big data management in such organization. The course will include the latest solutions in crowdfunding, CHIPS, and real-time payments, DLT investment finance, crypto-market efficiency, and cloud finance/economy. One part of the course teaches the use of artificial intelligence in digital finance, as well as machine learning process, especially in forecasting financial time series.						
Course Requirements: Financial Management, Statistics.							

Teaching Methods:

This course contains 36 credit hours of lectures and seminars.

The classes are organized in the form of ex cathedra. The seminars are organized in the form of Q&A, exercise, and practice. Each class is supported by seminar. Standard classrooms, equipped by standard facilities, used for learning process according to the requirements of technical equipment.

Course Director's Academic Background:

Dr. Darko B. Vukovic is GSOM Assoc. Professor of Finance with over 15 years of experience teaching finance courses at the postgraduate, graduate (master in corporate finance, CFA, ACCA, AMBA, AACSB accreditations), and undergraduate level; and upcoming head of research center “International laboratory of FinTech and Market Efficiency”, GSOM, Saint Petersburg University (the center is in the process of foundation and will be established in the summer of 2023). 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, and 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). He has published more than 70 papers indexed in leading index databases: Web of Science, Scopus and ABS (CABS), including leading journals in the field of finance and financial forecasting (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). He serves as a visiting professor at La Salle University, Bogota, Columbia.

Instructor's Academic Background:

See above.

Members of Teaching Team

Name	Gender	Professional Title	Department	Responsibility
Darko Vukovic	Male	1. Full Professor 2. Associate Professor 3. Head of International	1. Belgrade Banking Academy 2. GSOM 3. International Laboratory for	Delivering classes and seminars, Evaluation of Assessment of academic progress and Final test.

		Laboratory	Finance and Financial Markets, RUDN.	

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

Part 1: Foundations of digital transformation in finance.

The first part of the training refers to Fintech development beyond Industry 4.0. Students will be introduced to economic frictions and forces in financial services; technology advances in connectivity, data processing, and storage; Investment in CloudTech and DevOps companies; as also with the data-network-activity. Special attention will be focused on examples PayPal, Wealthfront, Pingit landing, Landing club, WeChat Pay, Alipay, China - a global leader in neo banking (WeBank, MYBank, aiBank, XW Bank).

Part 2: Main concepts of financial technologies

The second part of the training refers on use of FinTech in payments: Payment’s processing, SWIFT - the possibility of replacement? Financial infrastructure and ecosystem, its institutes, rules, and processes. Definitions and the essence of the main concepts: e-money, and e-wallet, payment processing, open API. Digital technologies and efficiency. How FX is Traded in the Dealer-Customer Market - An electronic communication network case. Payments are Getting Political Again. Centralized and decentralized DLT. The benefits of Distributed Ledger Technology. Digital Yuan. PayTech in the Cloud. Platforms for Payments. Invisible payments – Amazon Go and BingoBox in China. ACH and Real-Time payments. Tokenization.

Part 3: Block Chain and Smart Contracts

The third part trains students in block chain technology. Blockchain Foundation. Brief history of blockchain. Hash functions and cryptography. Digital signature. SHA 256, ETHASH. Private and public keys. Cryptocurrency: Centralized currency model. Decentralized currency model. Bitcoin Consensus Mechanism. Bitcoin Mining. Incentives and Proof of work. Hash puzzles and nonce. Creation of the chain. Blockchain technology in business – Walmart case, Blockchain-based Service Network. Public (permissionless) blockchain, Private (permissioned) blockchain, Hybrid blockchain, Consortium blockchain. Non-fungible tokens. Blockchain platforms. Implementation of Financial Derivatives: Smart Contracts in Blockchain. Applications of Blockchain to Different Domains. Blockchain Application in Banking sector and corporations. Oracle in Smart Contract.

Part 4: Crowdfunding

This part of the course will introduce students to the latest crowdfunding types and its potential. Benefits of token sales (TS), Difference between TS and traditional crowdfunding (business angel or venture capital investments), Blockchain Technology and Token Sales, Smart contracts and Initial Coin Offering (ICO). Turing complete smart contracts – Ethereum. ICO vs IPO vs VC. How Does ICO Work? ICO - Stages of a Token Sale. New Forms of Token Sales and Alternative Funding Vehicles. Types of ICO structures. Risks Associated with ICOs. Initial exchange offerings (IEOs), and Initial decentralized offerings (IDOs).

Part 5: Artificial intelligence and big data management in financial industry

The fifth part of the course deals with application of artificial intelligence in financial services, like personalized wealth management and asset management, portfolio risk assessment, as well as variety of novel usage-based insurance applications based on Internet-of-Things data. As a part of this, the topic also discusses big data in “Green” or ESG investment finance.

Part 6: Machine learning process in big data management

Machine Learning and artificial intelligence as processes of large data sets to detect patterns, generate predictions and recommendations, and improve effectiveness over time. Forecasting of financial data series and market efficiency. Forecasting errors. Hyperparameters tuning and optimizations. Real cases in forecasting. Program languages and models in machine learning techniques.

Part 7: International legal regulation

The last part will introduce students to the regulation of FinTech. The Role of the Regulators. The Payment Services Directive (PSD) 1 and 2 - Open Banking. Anti-money laundering directives. General Data Protection Regulation. Know Your Client. Know your data. Markets in Financial Instruments Directive 1 and 2. RegTech and SupTech. Digital personal identification. PBOC FinTech Development Scheme, Internet Finance Development Guiding Opinions, CBRIRC, CSRC.

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

The classes are organized in the form of *ex cathedra*. The lecturer on the course introduces the students to the topic material and gives practical examples.

The seminars are organized in the form of Q&A, exercise, and practice. Each class is supported by seminar. Students will have an open discussion at the seminars.

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

Yes, please. TA can assist in preparing classes/seminars materials, student records, etc.

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

Control forms	Weight in the course grade	Number of points in the course grade structure
Final test	50%	50
Assessment of academic progress	50%	50

Assessment of academic progress

Assignment	Weight in the course grade	Assignment description
Final course project	50%	The project is a paper prepared in teams and then presented on seminars. Students will get a grade both for their individual contribution to the project and answers during the Q&A session (25%) as well as a group grade for the overall work (25%).
Totally:	50%	

Final test

Form: pass / fail test

Length: 30 minutes

Format: online, open book, Questions type: multiple choice quiz.

Example of the question:

Please choose the correct answer(s):

- a) CommonBond is one of the world's largest peer-to-peer lending platform directly connects borrowers and investors by making credit more affordable and investing more rewarding and promoting a completely new loan program.
- b) Kickstarter is a marketplace lender that refinances graduate and undergraduate student loans.
- c) Wealthfront is a very large funding platform for creative projects, has strongly lowered the level of accessibility of funds for startups or simple projects.
- d) Lending Club embodies a fusion between finance and automation, allowing the management of assets through complex algorithms.
- e) None of the answers provided are correct.

Usage of Textbook: (X)Yes (complete textbook information form below)

Textbook Information (No more than two textbooks):

Chishti, S., Craddock, T., Courtneidge, R., & Zachariadis, M. (Eds.). (2020). The PAYTECH Book: The Payment Technology Handbook for Investors, Entrepreneurs, and FinTech Visionaries. John Wiley & Sons.

Lee, D. K. C., & Low, L. (2018). Inclusive fintech: blockchain, cryptocurrency and ICO. World Scientific.

Title	Author	ISBN	Publishing Time	Publisher	Type I	Type II
The PAYTECH Book: The Payment Technology Handbook for Investors	Chishti, S., Craddock, T., Courtneidge, R., & Zachariadis, M.	9781119551973	2020	John Wiley & Sons.	<input type="checkbox"/> Self-compiled Textbook (Published) <input type="checkbox"/> Non-mainland Textbook <input type="checkbox"/> Other Textbook (Published)	<input type="checkbox"/> National Planning Textbook <input type="checkbox"/> Provincial and Ministerial Planning Textbook <input type="checkbox"/> School Level Planning Textbook <input type="checkbox"/> Others
Inclusive fintech: blockchain, cryptocurrency and ICO	Lee, D. K. C., & Low, L.	9789813272767	2018	World Scientific	<input type="checkbox"/> Self-compiled Textbook (Published) <input type="checkbox"/> Non-mainland Textbook <input type="checkbox"/> Other Textbook (Published)	<input type="checkbox"/> National Planning Textbook <input type="checkbox"/> Provincial and Ministerial Planning Textbook <input type="checkbox"/> School Level Planning Textbook <input type="checkbox"/> Others

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

- Vukovic, D. B., Ingenito, S., & Maiti, M. (2023). Time series momentum: Evidence from the European equity market. *Heliyon*, 9, e12989.
- Frömmel M, Vukovic DB, Wu J. (2022). The Dollar Exchange Rate, Adjustment to the Purchasing Power Parity, and the Interest Rate Differential. *Mathematics*, 10(23):4504.
- Vukovic, D.B., Maiti, M., Grigorieva, E. (edt) (2022), *Digitalization and the Future of Financial Services*, 1st edition, Springer. 978-3-031-11544-8 (ISBN), Editorial book.
- Vukovic, D., Maiti, M., Frömmel, M. (2022). Inflation and portfolio selection, *Finance Research Letters* 50 (December 2022), 103202.
- Maiti, M., Vukovic, D., Vyklyuk, Y., Grubisic, Z. (2022). BRICS Capital Markets Co-Movement Analysis and Forecasting. *Risks*. 2022; 10(5):88.
- Vukovic, D. B., Romanyuk, K., Ivashchenko, S., & Grigorieva, E. (2022). Are CDS spreads predictable during the Covid-19 pandemic? Forecasting based on SVM, GMDH, LSTM and Markov switching autoregression. *Expert Systems with Applications*, 194, 116553.
- Spitsin, V., Mikhalechuk, A., Vukovic, D., Spitsina, L. (2022). Technical Efficiency of

- High-Technology Industries in the Crisis: Evidence from Russia, *Journal of Knowledge Economy*, (online first), 1-26.
8. Ranisavljevic, D., Vukovic, D.B., Maiti, M. (2021). Nexus of Bank Income Structure and Risk: Evidence from Balkans, *Global Business Review* (first published: 14 Oct 2021), 1–16.
 9. Maiti, M, Vuković, D, Mukherjee, A, Paikarao, PD, Yadav, JK. (2022). Advanced data integration in banking, financial, and insurance software in the age of COVID-19. *Softw: Pract Exper.* 52(4).
 10. Vukovic, D.B., Rincon, C.J. & Maiti, M. Price distortions and municipal bonds premiums: evidence from Switzerland. *Financial Innovation* 7, 60 (2021).
 11. Vukovic, D., Maiti, M., Grubisic; Z., Grigorieva, E., & Frömmel, M. (2021). COVID-19 Pandemic: Is the Crypto Market a Safe Haven? *The Impact of the First Wave, Sustainability* 2021, Volume 13, Issue 15, 8578.
 12. Vukovic, D., Lapshina, K., Maiti, M. (2021). Wavelet Coherence Analysis of Returns, Volatility and Interdependence of the US and the EU Money markets: Pre & Post Crisis, *The North American Journal of Economics and Finance*, 58 (2021), 101457.
 13. Vukovic, D.B., Maiti, M., Kochetkov, D. and Bystryakov, A. (2021), How attractive are municipal bonds for the passive competitiveness: the case of immunization of municipal bonds, *Competitiveness Review*, Vol. 31, No. 5, pp. 793-809.
 14. Maiti, M.; Grubisic, Z.; Vukovic, D.B. (2020). Dissecting Tether's Nonlinear Dynamics during Covid-19. *J. Open Innov. Technol. Mark. Complex.* 2020, 6, 161.
 15. Vukovic, D.B., Ugolnikov, V., Maiti, M. (2021). Sell-side analysts' recommendations a value or noise. *International Journal of Finance and Economics*, 26(2), 3134-3151.
 16. Vukovic, D., Prosin, V., Maiti, M. (2021). A study on the factors that governs US and EU YTM, *Accounting & Management (Contaduría y Administración)*, 66(3), 1-28.
 17. Maiti, M., Krakovich V., Shams, R., Vukovic, D. (2020). Resource based model for small innovative enterprises, *Management Decision*, Vol. 58 No. 8, pp. 1525-1541.
 18. Maiti, M., Vyklyuk, Y., Vukovic, D. (2020). Cryptocurrencies Chaotic Co-movement Forecasting with Neural Networks, *Internet Technology Letters*, 3(3), e157.
 19. Maiti M, Esson I. A, Vukovic, D. (2020). The impact of interest rate on the demand for credit in Ghana, *Journal Public Affairs (Wiley)*, 20, e2098.
 20. Vukovic D., Vyklyuk Y., Matsiuk N., Maiti M. (2020). Neural network forecasting in prediction Sharpe ratio: Evidence from EU debt market, *Physica A: Statistical Mechanics and its Applications*, 542(C): 123331.
 21. Vukovic, D.B., Ugolnikov, V. & Maiti, M. (2020). Analyst Says a Lot but Should You Listen: Evidence from Russia. *Journal of Economic Studies*, Vol. 47 No. 4, pp. 729-745
 22. Vukovic, D., Lapshina, K., Maiti, M. (2019). European Monetary Union Bond Market Dynamics: Pre & Post Crisis, *Research in International Business and Finance*, Vol 50 (C), 369-380.
 23. Vukovic D. (2019). The management of financial risk knowledge in the international conditions, in: *Cross- functional Knowledge Management: The International Landscape Vol. 1. The Annals of Business Research.* L., NY, Abingdon: Routledge, 2019. Ch. 13. P.

93-112. (Book chapter)

24. Vukovic, D. B., & Prosin, V. (2018). The prospective low risk hedge fund capital allocation line model: evidence from the debt market. *Oeconomia Copernicana*, 9(3), 419–439.

Table column size can be adjusted according to the content.