Stefano Pagliarani*- Curriculum Vitae

September 5, 2024

Personal data

- Stefano Pagliarani, born in Rimini (Italy), June 22nd, 1985. Married to Carolina, two children: Francesco and Lorenzo

Research interests

My research activity focuses on the study of several aspects of stochastic differential equations and their related Kolmogorov operators, including well-posedness, optimal regularity, asymptotic analysis, analytical and numerical approximations, and of their applications to mathematical finance. I am particularly interested in stochastic models that exhibit non-linear features or degenerate features, with a special focus on stochastic differential equations of mean-field (McKean-Vlasov) type and degenerate diffusions under weak-type Hörmander conditions. Recently, I became interested in singular stochastic control problems and stochastic games motivated by optimal goal-based investment and optimal installation of renewable energy sources.

Academic track

- 2019, December onward: associate professor (II fascia) of Probability and Statistics at Università di Bologna, Dipartimento di Matematica;
- 2017, December - 2019, November: associate professor (II fascia) of Mathematical Finance at Università di Udine, Dipartimento di Scienze Economiche e Statistiche (DIES);
- 2016, September - 2017, November: assistant professor (RTDA) at Università di Trieste, Dipartimento di Scienze Economiche, Aziendali, Matematiche e Statistiche "Bruno de Finetti" (DEAMS);

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- 2016, January - 2016, August: postdoctoral researcher at École Polytechnique, Centre de Mathématiques Appliquées - Paris. Position financed by the Louis Bachelier Finance and Sustainable Growth laboratory;

- 2014, January - 2015, December: postdoctoral researcher at École Polytechnique, Centre de Mathématiques Appliquées - Paris. Position financed by the Chair Financial Risks of the Risk Foundation;

- 2011, January - 2013, December (thesis defended on March 7th, 2014): PhD in Computational Mathematics at the University of Padova, Department of Mathematics (2014, March). Thesis supervisor: Prof. Tiziano Vargiolu;

- 2008, September - 2010, October (thesis defended on October 1st, 2010): Master Degree in Mathematics cum laude from the University of Bologna (2010, October). Thesis supervisor: Prof. Andrea Pascucci.

Qualifications

- 07/05/2021: Italian National Scientific Qualification for full professor in Probability (ASN, I fascia, settore concorsuale 01/A3);

- 20/04/2021: Italian National Scientific Qualification for full professor in Applied Mathematics (ASN, I fascia, settore concorsuale 13/D4);

- 28/03/2017 : Italian Natonal Scientific Qualification for associate professor in Probability (ASN, II fascia, settore concorsuale 01/A3);

- 28/03/2017: Italian National Scientific Qualification for associate professor in Applied Mathematics (ASN, II fascia, settore concorsuale 13/D4).

Grants

- 2025-2028: **project coordinator** of *Stochastic interacting systems: Limiting Behavior, Evaluation, Regularity and Applications (LiBERA)*, MSCA-SE project no. 101183168 funded by European Research Executive Agency (924 600 E.);

- 2024: **project coordinator** of *Degenerate McKean- Vlasov diffusions with rough coefficients and related PDEs*, supported by GNAMPA grant (3 500 E.) awarded by INDaM
`https://www.altamatematica.it/gnampa/attivita/progetti-di-ricerca/`;

- October 2023 - October 2025: project member of *Entropy Martingale Optimal Transport and McKean-Vlasov equations*, PRIN-2022 project no. 2022K28KB7_002 (CUP J53D23003800006) funded within PNRR;

- 2021: **project coordinator** of *UNA-Random*, supported by Seed Funding grant (14 965 E.) awarded by UNA Europa after competitive selection `https://sites.google.com/view/una-random/home`;

- 2017: beneficiary of FFABR (Fondo per il finanziamento delle attività base di ricerca). Personal research-grant (3 000 E.) awarded by the Italian Ministry of Education, University and Research after competitive selection;

- 2016: research grant (25 000 E.) issued by *Louis Bachelier Finance and Sustainable Growth laboratory* for the project *Analytical approximations for mean field equations and their applications to finance and economics* (project no.: ANR 11-LABX-0019).

Research papers

Submitted preprints:

[1] Issoglio E., Pagliarani S., Russo F., Trevisani D., *Degenerate McKean-Vlasov equations with drift in anisotropic negative Besov spaces*, Preprint 2024 - ArXiv

[2] Agarwal A., Amato A., Pagliarani S., dos Reis G., *Numerical approximation of McKean-Vlasov SDEs via Stochastic gradient descent*, 2023 - ArXiv

[3] Manfredini M., Pagliarani S., Polidoro S., *Intrinsic Hölder spaces for fractional kinetic operators*, 2023 - ArXiv

[4] Lucertini G., Pagliarani S., Pascucci A., *Optimal Schauder estimates for kinetic Kolmogorov equations with time measurable coefficients*, Preprint 2023 - ArXiv

Publications on international journals:

[5] Lucertini G., Pagliarani S., Pascucci A., *Optimal regularity for degenerate Kolmogorov equations in non-divergence form with rough-in-time coefficients*, **Journal of Evolution Equations**, 23, 69, 2023

[6] Kamm K., Pagliarani S., Pascucci A., *Numerical solution of kinetic SPDEs via stochastic Magnus expansion*, **Mathematics and Computers in Simulation**, 207, 189-208, 2023

[7] Pagliarani S., Polidoro S., *A Yosida's parametrix approach to Varadhan's estimates for a degenerate diffusion under the weak Hörmander condition*, **Journal of Mathematical Analysis and Applications**, 517(1), 2022

[8] Kamm K., Pagliarani S., Pascucci A., *On the stochastic Magnus expansion and its application to SPDEs*, **Journal of Scientific Computing**, 89(3), 56, 2021

[9] Agarwal A., Pagliarani S., *A Fourier-based Picard-iteration approach for a class of McKean-Vlasov SDEs with Lévy jumps*, **Stochastics: An International Journal of Probability and Stochastic Processes**, 93(4), pp. 592–624, 2021

[10] Lanconelli A., Pagliarani S., Pascucci A., *Local densities for a class of degenerate diffusions*, **Annales de l'Institut Henri Poincare, Probability and Statistics**, 56(2), 1440–1464, 2020

[11] Barletta A., Nicolato E., Pagliarani S., *The Short-time Behavior of VIX Implied Volatilities in a Multifactor Stochastic Volatility Framework*, **Mathematical Finance**, 29(3), 928–966, 2019

[12] Gobet E., Pagliarani S., *Analytical approximations of non-linear SDEs of McKean-Vlasov-type*, **Journal of Mathematical Analysis and Applications**, 466(1), pp. 71–106, 2018

[13] Pagliarani S., Pascucci A., *The exact Taylor formula of implied volatility*, **Finance and Stochastics**, 21(3), 661–718, 2017

[14] Pagliarani S., Pascucci A., Pignotti M., *Intrinsic expansions for averaged diffusion processes*, **Stochastic processes and their applications**, 127(8), 2560–2585, 2017

[15] Pagliarani S., Pascucci A., Pignotti M., *Intrinsic Taylor formulas for homogeneous Kolmogorov-type groups*, **Journal of Mathematical Analysis and Applications**, 435(2), 1054–1087, 2016

[16] Lorig M., Pagliarani S., Pascucci A., *Explicit Implied Vols for Multifactor Local-Stochastic Vol Models*, **Mathematical Finance**, 27(3), 926–960, 2015

[17] Gobet E., Pagliarani S., *Analytical approximations of BSDEs with non-smooth driver*, **SIAM Journal Finan. Math.**, 6(1), 919–958, 2015

[18] Lorig M., Pagliarani S., Pascucci A., *Analytical expansions for parabolic equations*, **SIAM J. Appl. Math.**, 75(2), 468–491, 2015

[19] Lorig M., Pagliarani S., Pascucci A., *A family of density expansions for Lévy-type processes*, **Annals of Applied Probability**, 25(1), 235–267, 2015

[20] Lorig M., Pagliarani S., Pascucci A., *Pricing Approximations and Error Estimates for Local Levy-Type Models with Default*, **Computers & Mathematics with Applications**, 69(10), pp. 1189–1219, May 2015

[21] Capponi A., Pagliarani S., Vargiolu T., *Pricing vulnerable claims in a Lévy driven model*, **Finance and Stochastics**, 18(4), 755-789, 2014

[22] Pagliarani S., Vargiolu T., *Portfolio optimization in a defaultable Lévy driven market model*, **OR Spectrum**, August 2014

[23] Pagliarani S., Pascucci A., *Asymptotic expansions for degenerate parabolic equations*, **C. R. Math. Acad. Sci. Paris**, 352(12), 1011–1016, 2014

[24] Lorig M., Pagliarani S., Pascucci A., *A Taylor series approach to pricing and implied vol for LSV models*, **Journal of Risk**, 17(2), 3–19, 2014

[25] Pagliarani S., Pascucci A., Riga C., *Adjoint expansions in local Lévy models*, **SIAM J. Finan. Math.**, 4(1), pp. 265-296, 2013

[26] Foschi P., Pagliarani S., Pascucci A., *Black-Scholes formulae for Asian options in local volatility models*, **Journal of Computational and Applied Mathematics**, 237, pp. 442-459, 2013

[27] Pagliarani S., Pascucci A., *Local stochastic volatility with jumps: analytical approximations*, **Int. J. Theor. Appl. Finance**, 16(8), 2013

[28] Pagliarani S., Pascucci A., *Analytical approximation of the transition density in a local volatility model*, **Cent. Eur. J. Math.**, 10(1), pp. 250-270, 2012

Proceeding papers and book chapters:

[29] Pagliarani S., Pignotti M., *Intrinsic Taylor formula for non-homogeneous Kolmogorov-type Lie groups*, in Kolmogorov Operators and Their Applications, Springer Volume, Editors: Stéphane Menozzi, Andrea Pascucci, Sergio Polidoro, 2024

[30] Lorig M., Pagliarani S., Pascucci A., *Asymptotics for d-dimensional Lévy-type processes*, in Large Deviations and Asymptotic Methods in Finance, Springer Proceedings in Mathematics & Statistics, Vol. 110, Editors: Friz P., Gatheral J., Gulisashvili A., Jacquier A., Teichmann J., 2015

Research visiting

- June 2023: Universitè d'Evry Val d'Essonne, invited by Professor Stéphane Menozzi
- July 2018: Seattle University, invited by Professor Matthew Lorig
- July 2018: Columbia University, invited by Professor Agostino Capponi
- February 2018: University of Glasgow, invited by Doctor Ankush Agarwal
- April 2017: Ecole Polytechnique, invited by Professor Emmanuel Gobet
- November 2015: Aarhus University (Denmark), invited by Professor Elisa Nicolato
- January 2015: Aarhus University (Denmark), invited by Professor Elisa Nicolato
- October 2013: Princeton (New Jersey, US), invited by Professor Matthew Lorig
- April-June 2013: Purdue University (Indiana, US), invited by Professor Agostino Capponi
- June-July 2012: Purdue University (Indiana, US), invited by Professor Agostino Capponi

Presentations in conferences, whorkshops and seminars

Mini-courses:

- February 14-16th, 2024: *Introduction to stochastic differential equations*, PhD mini-course at the doctoral school in Mathematics at Università di Udine

- June 25-28th, 2019: Workshop on Stochastic Analysis in Finance and Economics, Universidad de los Andes and Universidad del Rosario, Bogotá, Colombia. Mini-course on *Analytic approximations for option pricing, implied volatility, and stochastic control problems*

- November 3-4th, 2015: University of Aarhus. PhD course on *Analytical methods for PDEs in mathematical finance*. PhD course at University of Aarhus

Invited talks:

- February 2024: Two days on Regularity Results for Variational Problems and PDEs at Università di Modena e Reggio-Emilia, *Kinetic McKean-Vlasov equations with distributional drift*

- December 2023: Stochastic Sauna workshop at University of Helsinki, *Kinetic McKean-Vlasov equations with distributional drift*

- July 2023: ENSTA - ParisTech, Paris., *Numerical approximations of McKean-Vlasov SDEs via stochastic gradient descent*

- March 2023: Probability Seminars at University of Torino, Department of Mathematics, *Optimal Schauder estimates for degenerate-type Kolmogorov operators with rough coefficients*

- February 2023: Mathematical Physics Seminars at University of Arizona (Tucson, USA), *Numerical approximations of McKean-Vlasov SDEs via stochastic gradient descent*

- June 2022: Kolmogorov Operators and their Applications, Cortona, *Yosida parametrix and Varadhan estimates for a hypoelliptic diffusion*

- January 2022: Mathematical Finance seminar at Ritsumeikan University (online), *Yosida parametrix and Varadhan estimates for a hypoelliptic diffusion*

- May 2021: Seminari del Dipartimento di Matematica (online), Università di Modena, Modena. *Yosida parametrix and Varadhan estimates for a hypoelliptic diffusion*

- March 2019: Seminari del Dipartimento di Matematica, Università di Pisa, Pisa. *Contraction methods for a class of McKean-Vlasov SDEs with jumps*

- March 2019: Seminari del Dipartimento di Matematica, Università di Modena, Modena. *Local densities for a class of degenerate diffusions*

- February 2018: Wards Finance Seminar, Adam Smith Business School, University of Glasgow, Glasgow. *The short-time behavior of VIX imp. vol. in a multifactor stochastic volatility framework*

- November 2017: Seminari del Dipartimento di Dipartimento di Scienze Statistiche, University of Bologna, Bologna. *Analytical approximations for McKean-Vlasov diffusions*

- September 2017: Seminari del Dipartimento di Scienze Economiche, University of Verona, Verona. *VIX options and short-time behavior of VIX implied volatilities*

- June 2017: First Italian Meeting on Probability and Mathematical Statistics, Politecnico di Torino, Torino. *Analytical approximations for McKean-Vlasov diffusions*

- April 2017: GT Modles Stochastiques en Finance - CMAP, Ecole Polytechnique, France. *Analytical approximations for McKean-Vlasov diffusions*

- February 2017: Department of Statistics, University of Bologna, Rimini. *VIX options and short-time behavior of VIX implied volatilities*

- February 2017: Seminari di Finanza Matematica, Department of Mathematics, University of Bologna, Bologna. *Analytical approximations for McKean-Vlasov diffusions*

- March 2016: Department of Mathematics, Politecnico di Milano, Milano. *The parabolic Taylor formula of the implied volatility*

- January 2016: Job talk at Dept. of Statistics, University of Warwick, Paris. *The parabolic Taylor formula of the implied volatility*

- December 2015: Séminaire de probabilités et mathématiques financières, Université Evry Val d'Essonne, Paris. *Analytical approximations of BSDEs with non-smooth driver*

- January 2015: GT Methodes stochastiques et Finance, Marne-la-Vallee University, Paris. *Intrinsic Taylor formulas for homogeneous Kolmogorov-type groups*

- January 2015: Oberseminar Finanz- und Versicherungsmathematik - FakultÃ¤t fÃ¼r Mathematik, Technische UniversitÃ¤t MÃ¼nchen *Analytical approximations of BSDEs with non-smooth driver*

- December 2014: Department of Mathematics, University of Bologna *Analytical approximations of BSDEs with non-smooth driver*

- November 2014: GT Probabilites-Statistiques-Controle, ENSTA - ParisTech, Paris. *Intrinsic Taylor formulas for homogeneous Kolmogorov-type groups*

- September 2014: GT Modles Stochastiques en Finance - CMAP, Ecole Polytechnique, Paris. *Analytical approximations of BSDEs with non-smooth driver*

- March 2014: Workshop in Model Approximation and Numerical Methods - University of Paris 7, Paris. *Analytical expansions for PIDE's in option pricing*

- November 2013: University of Vienna - University of Technology FAM, Vienna. *Analytical expansions for PIDE's: a general framework*

- November 2013: School of Business and Social Sciences, Aarhus. *Asymptotic expansions for PIDE's in option pricing*

- October 2013: Rutgers University, Piscataway . *Analytical approximations in defaultable Lévy driven models with local-stochastic volatility*

- July 2013: CMAP - Ecole Polytechnique, Paris. *Analytical Approximations in Volatility Models*

- July 2013: Institute of Mathematics - TU, Berlin. *Analytical Approximations in Volatility Models*

- January 2012: Prometeia spa, Bologna. *Approximation Formulae for Asian Options in Local Volatility Models*

- April 2011: Computational Management Science, Neuchatel. *Analytical Approximation of Models with Jumps*

Other talks

- June 2023: International Conference on Monte Carlo Methods and Applications. Sorbonne University, Paris. *Numerical approximations of McKean-Vlasov SDEs via stochastic gradient descent*

- September 2018: Workshop on BSDEs, Information and McKean-Vlasov equations. University of Leeds, Leeds. *A Fourier fixed-point approach for a class of McKean-Vlasov SDEs with Lévy jumps*

- January 2018: XIX Workshop on Quantitative Finance, University of Roma-Tre. *The short-time behavior of VIX imp. vol. in a multifactor stochastic volatility framework*

- January 2017: XVIII Workshop on Quantitative Finance, University of Milano-Bicocca. *Analytical approximations for McKean-Vlasov diffusions*

- December 2015: Research in Options 2015 at IMPA, Rio de Janeiro. *The parabolic Taylor formula of the implied volatility*

- October 2013: AMS Fall Eastern Sectional Meeting, Philadelphia. *Integro-differential expansions for defaultable local Lévy models*

- January 2013: XIV Workshop on Quantitative Finance, Rimini. *Portfolio optimization in a defaultable Lévy driven market model*

- September 2012: XXXVI Convegno AMASES, Vieste (FG). *Portfolio optimization in a defaultable Lévy driven market model*
- January 2012: XIII Workshop on Quantitative Finance, L'Aquila. *Black-Scholes formulae for Asian options in local volatility models*
- September 2011: XXXV Convegno AMASES, Pisa. *Approximation Formulae for Asian Options in Local Volatility Models*
- July 2011: Summer School SMI, Cortona. *Introduction to Stochastic Processes with Jumps*

Refereeing activity

Finance and Stochastics, Mathematical Finance, SIAM Journal on Financial Mathematics, Stochastic Processes and their Applications, Proceedings of the Royal Society A, European Journal of Applied Mathematics, Journal of Elliptic and Parabolic Equations, IMA Journal of Numerical Analysis, Journal of Optimization Theory and Applications, Communication in nonlinear sciences and numerical simulation, Mathematics in Engineering, Journal of Computational Finance, International Journal of Theoretical and Applied Finance, International Review of Economics and Finance, Applied Mathematical Finance, Digital Finance, Quantitative Finance

PhD supervisions

- from November 2023: supervisor of Andrea Amato, PhD program in Mathematics at University of Bologna
- November 2021 - October 2024: co-supervisor of Giacomo Lucertini, PhD program in Mathematics at University of Bologna

Organization of PhD courses

- May 2024: Prof. Elena Bandini, *An introduction to stochastic calculus for jump processes* (`https://phd.unibo.it/matematica/en/teaching/2023-2024`)
- May 2024: Prof. Francesco Russo, *Stochastic differential equations with non-Lipschitz (possible singular) coefficients* (`https://phd.unibo.it/matematica/en/teaching/2023-2024`)
- May 2023: Prof. Eva Löcherbach, *McKean-Vlasov models for systems of spiking neurons* (`https://phd.unibo.it/matematica/en/teaching/2022-2023`)

- March 2022: Prof. Nicolas Perkowski, *Introduction to singular SPDEs via paracontrolled distributions* (`https://phd.unibo.it/matematica/en/teaching/2021-2022`)

Organization of scientific events

- June 2025 (to come): co-organizer (with Elena Issoglio and Francesco Russo) of the workshop *Irregular Stochastic Analysis*, at Palazzone di Cortona, funded by INdAM (`https://events.unibo.it/irreg-stoch-indam-cortona-25/`)

- January 2025 (to come): co-organizer of the *Dolomites winter school on Optimal Transport: from robust pricing to model calibration*, funded by PRIN-22 (`https://sites.google.com/view/dolomitesws25`)

- June 2024: co-organizer (with Elena Issoglio) of the session *Mckean-Vlasov equations and related PDEs* at 4th italian meeting in Probability & mathematical statistics

- 2024: co-organizer (with Lorenzo Cerboni Baiardi) of the cycle of seminars *Stchastics and Applications* at University of Bologna (`https://www.dm.unibo.it/seminari/mat/serials/36`)

- 2022, June: organizer of the workshop *"Mathematics of random complex systems"* `https://eventi.unibo.it/una-random-workshop`

- 2022, June: co-organizer (together with Andra Cosso, Elena Bandini, Andrea Pascucci and Antonello Pesce) of the conference *"Third Italian Meeting on Probability and Mathematical Statistics"*, at Università di Bologna, Dipartimento di Matematica. (`https://site.unibo.it/probstat/en/contacts`)

- Oct 2021 - Oct 2022: co-organizer (together with Antonella Grassi) of the cycle of PhD seminars *Topics in Mathematics*, Dipartimento di Matematica, Univerisità di Bologna. (`https://www.dm.unibo.it/seminari/mat/serials/28`)

- 2019, January: co-organizer (together with Andra Cosso, Alberto Lanconelli, Andrea Pascucci and Antonello Pesce) of the *Winter School on "Stochastic PDEs and Mean-Field Games"*, at Università di Bologna, Dipartimento di Matematica

- 2015, September - 2016 June: co-organizer (together with Stefano De Marco) of the cycle of seminars *Modèles Stochastiques en Finance* (Stochastic models for finance) at CMAP, École Polytechnique

Other scientific responsibilities

- from 2021 onwards: faculty member of the PhD program (collegio docenti) in Mathematics at University of Bologna.

- 2022, Jan - 2024, Dec: scientific supervisor of the research project *"Ottimizzazione stocastica per la produzione di energia da fonti rinnovabili"*, funded by the Italian Ministry of Education, University and Research within (PON) "Ricerca e Innovazione" 2014-2020

- 2020 - 2021: faculty member of the PhD program (collegio docenti) in Statistics at University of Padua

- 2013-2018: co-author (together with Matthew Lorig and Andrea Pascucci) of the blog *ExplicitSolutions, Analytic formulae in option pricing*, an online repository for Mathematica notebooks on analytical approximation methods in option pricing. (`https://explicitsolutions.wordpress.com/`)

Institutional duties

- Participation in hiring panels (commissioni concorsi):
  - 2024 - member of the PhD hiring panel for the selection DM630_2024, Department of Mathematics at University of Bologna
  - 2023 - member of the hiring commission for associate professor position (professore II fascia) at University of Torino
  - 2022 - member (segretario) of the hiring commission for fixed-term assistant professor position (RTDA) at University of Bologna
  - 2022 - member of the hiring commission for fixed-term assistant professor position (RTDA) at University of Padova
- Participation in PhD boards (commissioni dottorato):
  - 2023 - PhD defense of Kevin Kamm and Elisa Raspanti, University of Bologna
  - 2018 - PhD defense of Anastasia Borovykh, University of Bologna
- Participation in department commissions:
  - 2024 onwards: member of the Research Committee of the Department of Mathematics at the University of Bologna
  - 2024 onwards: member of the Quality Assurance Committee of the PhD program in Mathematics at the University of Bologna
  - 2022 onwards: member of the Quality Assurance Committee of the Bachelor's and Master's degree in Mathematics at the University of Bologna
  - 2022 onwards: member of the Admission Board of the Master's degree in Mathematics at the University of Bologna

Supervising activity

A.Y. 2022-2023:

- Master thesis advisor (or co-advisor) of: Andrea Amato, Alessandro Borgia, Salvatore D'Izzia
- Bachelor thesis advisor (or co-advisor) of: Andrea Astolfi, Claudia Maiolino

A.Y. 2021-2022:

- Bachelor thesis advisor (or co-advisor) of: Klaidi Hoxha, Mattia Marabini, Lea Pezzoli

A.Y. 2020-2021:

- Master thesis advisor (or co-advisor) of: Davide Trevisani, Giacomo Lucertini, Alessandro Sforza
- Bachelor thesis advisor (or co-advisor) of: Alessandro Annecchini, Irene Balzani, Maria Vittoria Bonini, Pietro Sittoni, Mattia Suzzi, Maria Giovanna Ficcadenti, Emanuele Fioriti, Riccardo Agabiti, Nicola Pegoretti, Giorgia Rensi

A.Y. 2019-2020:

- Master thesis co-advisor of Arianna Mingone, Università degli studi di Udine, Corso di Laurea Magistrale in Matematica
- Bachelor thesis advisor of: Andrea Amato, Università di Bologna

A.Y. 2018-2019:

- Midterm thesis advisor of Arianna Mingone, Scuola Superiore dell'Università degli studi di Udine

A.Y. 2015-2016:

- Master thesis co-advisor of Mariella Parussini, Università degli studi di Trieste, Corso di Laurea Magistrale in Scienze Statistiche ed Attuariali

Teaching

A.Y. 2024-2025:

- *Term Structure of Interest Rates.* Course of the higher education program in Mathematical Finance at University of Bologna
- *Credit risk.* Course of the higher education program in Mathematical Finance at University of Bologna
- *Probabilistic Methods for the Applications.* Course of the bachelor degree in *Mathematics* at University of Bologna
- *Stochastic Calculus.* Course of the master degree in *Advanced Mathematics for the Applications* at University of Bologna

- *Probabilistic Methods for Machine Learning.* Course of the bachelor (master) degree in *Mathematics* (*Advanced Mathematics for the Applications*) at University of Bologna
- *Probability and Statistics.* Course of the bachelor degree in *Computer Science* at University of Bologna

A.Y. 2023-2024:

- *Introduction to stochastic differential equations.* PhD mini-course at the doctoral school in Mathematics at Università di Udine
- *Term Structure of Interest Rates.* Course of the higher education program in Mathematical Finance at University of Bologna
- *Credit risk.* Course of the higher education program in Mathematical Finance at University of Bologna
- *Probabilistic Methods for the Applications.* Course of the bachelor degree in *Mathematics* at University of Bologna
- *Stochastic Calculus.* Course of the master degree in *Advanced Mathematics for the Applications* at University of Bologna
- *Probabilistic Methods for Machine Learning.* Course of the bachelor (master) degree in *Mathematics* (*Advanced Mathematics for the Applications*) at University of Bologna

A.Y. 2022-2023:

- *Term Structure of Interest Rates.* Course of the higher education program in Mathematical Finance at University of Bologna
- *Credit risk.* Course of the higher education program in Mathematical Finance at University of Bologna
- *Probability Theory.* Course of the doctoral program in Statistics at University of Padua
- *Probabilistic Methods for the Applications.* Course of the bachelor degree in *Mathematics* at University of Bologna
- *Stochastic Calculus.* Course of the master degree in *Advanced Mathematics for the Applications* at University of Bologna
- *Probability and Statistics.* Course of the bachelor degree in *Computer Science* at University of Bologna

A.Y. 2021-2021:

- *Term Structure of Interest Rates.* Course of the higher education program in Mathematical Finance at University of Bologna
- *Probability Theory.* Course of the doctoral program in Statistics at University of Padua

- *Probabilistic Methods for the Applications.* Course of the bachelor degree in *Mathematics* at University of Bologna
- *Stochastic Calculus.* Course of the master degree in *Advanced Mathematics for the Applications* at University of Bologna

A.Y. 2021-2021:

- *Term Structure of Interest Rates.* Course of the higher education program in Mathematical Finance at University of Bologna
- *Probability Theory.* Course of the doctoral program in Statistics at University of Padua
- *Probabilistic Methods for the Applications.* Course of the bachelor degree in *Mathematics* at University of Bologna
- *Stochastic Calculus.* Course of the master degree in *Advanced Mathematics for the Applications* at University of Bologna
- *Mathematics.* Course of the bachelor degree in *Animal production* at University of Bologna

A.Y. 2020-2021:

- *Term Structure of Interest Rates.* Course of the higher education program in Mathematical Finance at University of Bologna
- *Probability Theory.* Course of the doctoral program in Statistics at University of Padua
- *Probabilistic methods for finance.* Course of the bachelor degree in *Mathematics* at University of Bologna
- *Stochastic Differential Equations.* Course of the master degree in *Mathematics* at University of Bologna
- *Mathematics.* Course of the bachelor degree in *Animal production* at University of Bologna
- *Probability and Statistics.* Course of the master degree in *Agricultural technologies* at University of Bologna

A.Y. 2019-2020:

- *Term Structure of Interest Rates.* Course of the higher education program in Mathematical Finance at University of Bologna
- *Probability Theory.* Course of the doctoral program in Statistics at University of Padua
- *Probabilistic methods for finance.* Course of the bachelor degree in *Mathematics* at University of Bologna
- *Stochastic Differential Equations.* Course of the master degree in *Mathematics* at University of Udine

- *General Mathematics*. Course of the bachelor degree in *Economics* at University of Udine
- *Quantitative Models for Business Measurement* (option pricing and portfolio theory). Course of the master degree in *Business Economics* at University of Udine

A.Y. 2018-2019:

- *Stochastic Differential Equations*. Course of the master degree in *Mathematics* at University of Udine
- *General Mathematics*. Course of the bachelor degree in *Economics* at University of Udine

- A.Y. 2017-2018:

  - *Financial Mathematics of Uncertainty* (option pricing theory) (language: English). Course of the master degree in *Banca e finanza* at University of Udine
  - *Matematica per l'economia* (multi-dimension differential calculus and financial mathematics). Course of the bachelor degree *Economia internazionale e mercati finanziari* at University of Trieste

A.Y. 2016-2017:

- Assistantship for the course of *Probabilità Elementare* of the bachelor degree *Statistica e informatica per l'azienda, la finanza e l'assicurazione* at University of Trieste
- *Matematica per l'economia* (multi-dimension differential calculus and financial mathematics). Course of the bachelor degree *Economia internazionale e mercati finanziari* at University of Trieste

A.Y. 2015-2016:

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