REFERENCES FOR THE MINI-WORKSHOP IN STOCHASTIC ANALYSIS
MAY 21 – 24, 2021

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1. Background Reading and General References

1.1. Probability Theory.

- A. N. Shiryaev. *Probability*, volume 95 of *Graduate Texts in Mathematics*. Springer-Verlag, New York, second edition, 1996. Translated from the first (1980) Russian edition by R. P. Boas
- David Williams. *Probability with martingales*. Cambridge Mathematical Textbooks. Cambridge University Press, Cambridge, 1991
- Olav Kallenberg. *Foundations of modern probability*, volume 99 of *Probability Theory and Stochastic Modelling*. Springer, Cham, third edition, 2021

1.2. Functional Analysis and Operator Theory.

- Kōsaku Yosida. *Functional analysis*. Classics in Mathematics. Springer-Verlag, Berlin, 1995. Reprint of the sixth (1980) edition
- Richard V. Kadison and John R. Ringrose. *Fundamentals of the theory of operator algebras. Vol. II*, volume 16 of *Graduate Studies in Mathematics*. American Mathematical Society, Providence, RI, 1997. Advanced theory, Corrected reprint of the 1986 original
- Richard V. Kadison and John R. Ringrose. *Fundamentals of the theory of operator algebras. Vol. I*, volume 15 of *Graduate Studies in Mathematics*. American Mathematical Society, Providence, RI, 1997. Elementary theory, Reprint of the 1983 original
- M. Takesaki. *Theory of operator algebras. I*, volume 124 of *Encyclopaedia of Mathematical Sciences*. Springer-Verlag, Berlin, 2002. Reprint of the first (1979) edition, Operator Algebras and Non-commutative Geometry, 5

2. Stochastic Processes and Integration

2.1. Stochastic Processes.

- David Applebaum. *Lévy processes and stochastic calculus*, volume 93 of *Cambridge Studies in Advanced Mathematics*. Cambridge University Press, Cambridge, 2004
- Fabrice Baudoin. *Diffusion processes and stochastic calculus*. EMS Textbooks in Mathematics. European Mathematical Society (EMS), Zürich, 2014

- Ioannis Karatzas and Steven E. Shreve. *Brownian motion and stochastic calculus*, volume 113 of *Graduate Texts in Mathematics*. Springer-Verlag, New York, second edition, 1991
- Ken-iti Sato. *Lévy processes and infinitely divisible distributions*, volume 68 of *Cambridge Studies in Advanced Mathematics*. Cambridge University Press, Cambridge, 2013. Translated from the 1990 Japanese original, Revised edition of the 1999 English translation

Although we do not have time to prove the Bichteler–Dellacherie theorem in the course, one should consult the proof shown here:

- Mathias Beiglböck, Walter Schachermayer, and Bezirgen Veliyev. A direct proof of the Bichteler-Dellacherie theorem and connections to arbitrage. *Ann. Probab.*, 39(6):2424–2440, 2011

2.2. **Foundations of Stochastic Differential Equations.**

- Pao-Liu Chow. *Stochastic partial differential equations*. Advances in Applied Mathematics. CRC Press, Boca Raton, FL, second edition, 2015
- Lawrence C. Evans. *An introduction to stochastic differential equations*. American Mathematical Society, Providence, RI, 2013
- Bernt Øksendal. *Stochastic differential equations*. Universitext. Springer-Verlag, Berlin, sixth edition, 2003. An introduction with applications
- Philip E. Protter. *Stochastic integration and differential equations*, volume 21 of *Stochastic Modelling and Applied Probability*. Springer-Verlag, Berlin, 2005. Second edition. Version 2.1, Corrected third printing

2.2.1. *Variational Techniques.*

- Wei Liu and Michael Röckner. *Stochastic partial differential equations: an introduction*. Universitext. Springer, Cham, 2015

2.2.2. *Semigroup Techniques.*

- Giuseppe Da Prato and Jerzy Zabczyk. *Stochastic equations in infinite dimensions*, volume 152 of *Encyclopedia of Mathematics and its Applications*. Cambridge University Press, Cambridge, second edition, 2014

2.2.3. *Martingale Techniques.*

- John B. Walsh. An introduction to stochastic partial differential equations. In *École d'été de probabilités de Saint-Flour, XIV—1984*, volume 1180 of *Lecture Notes in Math.*, pages 265–439. Springer, Berlin, 1986

3. Vector-Valued Analysis

3.1. **Vector-Valued Integration and Probability.**

- J. Diestel and J. J. Uhl, Jr. *Vector measures*. American Mathematical Society, Providence, R.I., 1977. With a foreword by B. J. Pettis, Mathematical Surveys, No. 15
- Michel Talagrand. Pettis integral and measure theory. *Mem. Amer. Math. Soc.*, 51(307):ix+224, 1984
- Gilles Pisier. *Martingales in Banach spaces*, volume 155 of *Cambridge Studies in Advanced Mathematics*. Cambridge University Press, Cambridge, 2016

- Tuomas Hytönen, Jan van Neerven, Mark Veraar, and Lutz Weis. *Analysis in Banach spaces. Vol. I. Martingales and Littlewood-Paley theory*, volume 63 of *Ergebnisse der Mathematik und ihrer Grenzgebiete. 3. Folge. A Series of Modern Surveys in Mathematics [Results in Mathematics and Related Areas. 3rd Series. A Series of Modern Surveys in Mathematics]*. Springer, Cham, 2016
- Tuomas Hytönen, Jan van Neerven, Mark Veraar, and Lutz Weis. *Analysis in Banach spaces. Vol. II*, volume 67 of *Ergebnisse der Mathematik und ihrer Grenzgebiete. 3. Folge. A Series of Modern Surveys in Mathematics [Results in Mathematics and Related Areas. 3rd Series. A Series of Modern Surveys in Mathematics]*. Springer, Cham, 2017. Probabilistic methods and operator theory

3.2. **UMD Banach Spaces.**

- D. L. Burkholder. A geometrical characterization of Banach spaces in which martingale difference sequences are unconditional. *Ann. Probab.*, 9(6):997–1011, 1981
- Donald L. Burkholder. Martingales and Fourier analysis in Banach spaces. In *Probability and analysis (Varenna, 1985)*, volume 1206 of *Lecture Notes in Math.*, pages 61–108. Springer, Berlin, 1986
- Jean Bourgain. Vector-valued singular integrals and the H^1-BMO duality. In *Probability theory and harmonic analysis (Cleveland, Ohio, 1983)*, volume 98 of *Monogr. Textbooks Pure Appl. Math.*, pages 1–19. Dekker, New York, 1986

3.3. **Stochastic Analysis in UMD Spaces and Spaces of Operators.**

- Jan van Neerven, Mark Veraar, and Lutz Weis. Stochastic integration in Banach spaces—a survey. In *Stochastic analysis: a series of lectures*, volume 68 of *Progr. Probab.*, pages 297–332. Birkhäuser/Springer, Basel, 2015
- Markus Kunze and Jan van Neerven. Approximating the coefficients in semilinear stochastic partial differential equations. *J. Evol. Equ.*, 11(3):577–604, 2011
- J. M. A. M. van Neerven, M. C. Veraar, and L. Weis. Stochastic evolution equations in UMD Banach spaces. *J. Funct. Anal.*, 255(4):940–993, 2008
- J. M. A. M. van Neerven and L. Weis. Stochastic integration of operator-valued functions with respect to Banach space-valued Brownian motion. *Potential Anal.*, 29(1):65–88, 2008
- J. M. A. M. van Neerven, M. C. Veraar, and L. Weis. Stochastic integration in UMD Banach spaces. *Ann. Probab.*, 35(4):1438–1478, 2007
- Jan van Neerven and Markus Riedle. A semigroup approach to stochastic delay equations in spaces of continuous functions. *Semigroup Forum*, 74(2):227–239, 2007

4. Operator-Valued, Semi-Commutative, and Noncommutative Analysis

4.1. **Semi-Commutative Harmonic Analysis.**

- Javier Parcet. Pseudo-localization of singular integrals and noncommutative Calderón-Zygmund theory. *J. Funct. Anal.*, 256(2):509–593, 2009

- Léonard Cadilhac. Weak boundedness of Calderón-Zygmund operators on noncommutative L_1-spaces. *J. Funct. Anal.*, 274(3):769–796, 2018
- Tao Mei. Operator valued Hardy spaces. *Mem. Amer. Math. Soc.*, 188(881):vi+64, 2007

4.2. **Noncommutative Integration.**

- Gilles Pisier and Quanhua Xu. Non-commutative L^p-spaces. In *Handbook of the geometry of Banach spaces, Vol. 2*, pages 1459–1517. North-Holland, Amsterdam, 2003
- Thierry Fack and Hideki Kosaki. Generalized s-numbers of τ-measurable operators. *Pacific J. Math.*, 123(2):269–300, 1986
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- Javier Parcet and Narcisse Randrianantoanina. Gundy's decomposition for non-commutative martingales and applications. *Proc. London Math. Soc. (3)*, 93(1):227–252, 2006
- Marius Junge and Mathilde Perrin. Theory of H_p-spaces for continuous filtrations in von Neumann algebras. *Astérisque*, (362):vi+134, 2014

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