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PhD in Statistical Sciences  
*Probability Theory*  
Academic Year 2009/2010

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Instructors: Marco Ferrante and Giovanni Fonseca

January-February 2010

Prerequisite: Chapters 2, 3, 4 and 5 of [JP], with ALL the exercises.

Course Schedule:

January 2010

- Tuesday 12, 10.00-13.00 (Ferrante): Construction of a Probability Measure (Ch.6-7, [JP])
- Tuesday 19, 10.00-13.00 (Ferrante): Integration with respect to a Probability Measure (Ch.8-9, [JP])
- Friday 22, 10.00-13.00 (Ferrante): Independent Random Variables and Probability Distributions on  $\mathbb{R}$  (Ch.10-11, [JP])
- Tuesday 26, 10.00-13.00 (Ferrante): Probability Distributions on  $\mathbb{R}^n$  (Ch.12, [JP])
- Friday 29, 10.00-13.00 (Ferrante): Exercises

February 2010

- Tuesday 2, 10.00-13.00 (Ferrante): Conditional expectation I (Ch.2, [Gut] and Ch.22, [JP])
- Friday 5, 10.00-13.00 (Ferrante): Conditional expectation II (Ch.2, [Gut] and Ch.23, [JP])
- Monday 8, 13.00-16.00 (Ferrante): Convergence of Random Variables (Ch.17-18, [JP] and Ch. 6 [Gut])
- Tuesday 9, 10.00-14.00 (Fonseca): Discrete time Markov chains (Ch.1, [NOR])
- Friday 12, 10.00-14.00 (Fonseca): Continuous time Markov chains (Ch.2-3, [NOR])
- Tuesday 16, 10.00-13.00 (Ferrante): Law of Large Numbers and Central Limit Theorem (Ch.20-21, [JP] and Ch. 6 [Gut])

- Friday 19, 10.00-14.00 (Fonseca): Poisson process and Brownian motion (Ch.4-6, [RES])

Text:

[Gut] A.Gut, An intermediate course in probability, Springer Verlag, 1995.

[JP] J.Jacod, P.Protter, Probability essentials, 2nd edition, Universitext, Springer Verlag, 2002.

[NOR] J.R.Norris, Markov chains, Cambridge University Press, 1997.

[RES] S.I.Resnick, Adventures in Stochastic Processes, Birkhauser, 1992.