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Titolo	A Course on Rough Paths : With an Introduction to Regularity Structures // by Peter K. Friz, Martin Hairer
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ISBN	3-319-08332-5
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Descrizione fisica	1 online resource (XIV, 251 p. 2 illus.)
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Disciplina	519.2
Soggetti	Probabilities Differential equations Differential equations, Partial Probability Theory and Stochastic Processes Ordinary Differential Equations Partial Differential Equations
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Bibliographic Level Mode of Issuance: Monograph
Nota di contenuto	Introduction -- The space of rough paths -- Brownian motion as a rough path -- Integration against rough paths -- Stochastic integration and Itô's formula -- Doob–Meyer type decomposition for rough paths -- Operations on controlled rough paths -- Solutions to rough differential equations -- Stochastic differential equations -- Gaussian rough paths -- Cameron–Martin regularity and applications -- Stochastic partial differential equations -- Introduction to regularity structures -- Operations on modelled distributions -- Application to the KPZ equation.
Sommario/riassunto	Lyons' rough path analysis has provided new insights in the analysis of stochastic differential equations and stochastic partial differential equations, such as the KPZ equation. This textbook presents the first thorough and easily accessible introduction to rough path analysis. When applied to stochastic systems, rough path analysis provides a means to construct a pathwise solution theory which, in many respects, behaves much like the theory of deterministic differential equations and provides a clean break between analytical and probabilistic

arguments. It provides a toolbox allowing to recover many classical results without using specific probabilistic properties such as predictability or the martingale property. The study of stochastic PDEs has recently led to a significant extension – the theory of regularity structures – and the last parts of this book are devoted to a gentle introduction. Most of this course is written as an essentially self-contained textbook, with an emphasis on ideas and short arguments, rather than pushing for the strongest possible statements. A typical reader will have been exposed to upper undergraduate analysis courses and has some interest in stochastic analysis. For a large part of the text, little more than Itô integration against Brownian motion is required as background.
