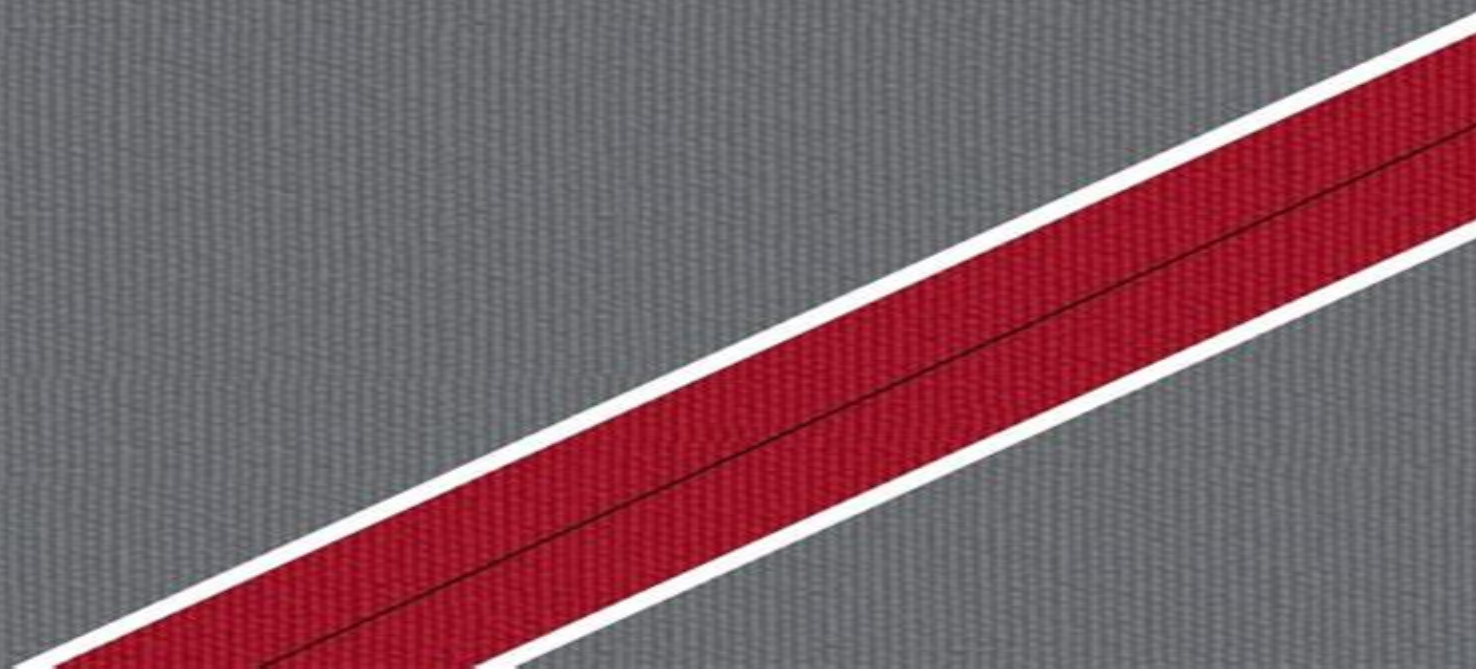


# Basic Category Theory

**TOM LEINSTER**



# Basic Category Theory Cambridge Studies In Advanced Mathematics

**Benjamin C. Pierce**



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[Category Theory in Context](#) Emily Riehl, 2017-03-09 Introduction to concepts of category theory categories functors natural transformations the Yoneda lemma limits and colimits adjunctions monads

revisits a broad range of mathematical examples from the categorical perspective 2016 edition      **A First Course in Category Theory** Ana Agore, 2023-12-12 This textbook provides a first introduction to category theory a powerful framework and tool for understanding mathematical structures Designed for students with no previous knowledge of the subject this book offers a gentle approach to mastering its fundamental principles Unlike traditional category theory books which can often be overwhelming for beginners this book has been carefully crafted to offer a clear and concise introduction to the subject It covers all the essential topics including categories functors natural transformations duality equivalence co limits and adjunctions Abundant fully worked examples guide readers in understanding the core concepts while complete proofs and instructive exercises reinforce comprehension and promote self study The author also provides background material and references making the book suitable for those with a basic understanding of groups rings modules topological spaces and set theory Based on the author's course at the Vrije Universiteit Brussel the book is perfectly suited for classroom use in a first introductory course in category theory Its clear and concise style coupled with its detailed coverage of key concepts makes it equally suited for self study      **Involutive Category Theory** Donald Yau, 2020-11-30 This monograph introduces involutive categories and involutive operads featuring applications to the GNS construction and algebraic quantum field theory The author adopts an accessible approach for readers seeking an overview of involutive category theory from the basics to cutting edge applications Additionally the author's own recent advances in the area are featured never having appeared previously in the literature The opening chapters offer an introduction to basic category theory ideal for readers new to the area Chapters three through five feature previously unpublished results on coherence and strictification of involutive categories and involutive monoidal categories showcasing the author's state of the art research Chapters on coherence of involutive symmetric monoidal categories and categorical GNS construction follow The last chapter covers involutive operads and lays important coherence foundations for applications to algebraic quantum field theory With detailed explanations and exercises throughout Involutive Category Theory is suitable for graduate seminars and independent study Mathematicians and mathematical physicists who use involutive objects will also find this a valuable reference      Monoidal Category Theory Noson S. Yanofsky, 2024-11-05 A comprehensive cutting edge and highly readable textbook that makes category theory and monoidal category theory accessible to students across the sciences Category theory is a powerful framework that began in mathematics but has since expanded to encompass several areas of computing and science with broad applications in many fields In this comprehensive text Noson Yanofsky makes category theory accessible to those without a background in advanced mathematics Monoidal Category Theory demonstrates the expansive uses of categories and in particular monoidal categories throughout the sciences The textbook starts from the basics of category theory and progresses to cutting edge research Each idea is defined in simple terms and then brought alive by many real world examples before progressing to theorems and uncomplicated proofs Richly guided exercises ground readers in concrete computation and application The

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*Category Theory Using Haskell*  
Shuichi Yukita, 2024-12-06. This unique book offers an introductory course on category theory which became a working language in algebraic geometry and number theory in the 1950s and began to spread to logic and computer science soon after it was created. Offering excellent use of helpful examples in Haskell, the work covers among other things concepts of functors, natural transformations, monads, adjoints, universality, category equivalence and many others. The main goal is to understand the Yoneda lemma which can be used to reverse engineer the implementation of a function. Later chapters offer more insights into computer science including computation with output, nondeterministic computation and continuation passing. Topics and features: Contains rigorous mathematical arguments to support the theory. Provides numerous Haskell code implementing examples. Engages with plentiful diagram chasing with special emphasis on the design patterns for constructing a large diagram out of basic small pieces. Offers insights into category theory to quantum computing and the foundation of computing discipline. Serves as a preparatory course for monoidal categories and higher categories. The work will be useful to undergraduate students in computer science who have enough background in college mathematics such as linear algebra and basics in Haskell polymorphic functions. Further it will appeal to graduate students and researchers in computing disciplines who want to newly acquire serious knowledge of category theory.

*Category Theory in Physics, Mathematics, and Philosophy*  
Marek Kuś, Bartłomiej Skowron, 2019-11-11. The contributions gathered here demonstrate how categorical ontology can provide a basis for linking three important basic sciences: mathematics, physics and philosophy. Category theory is a new formal ontology that shifts the main focus from objects to processes. The book approaches formal ontology in the original sense put forward by the philosopher Edmund Husserl, namely as a science that deals with entities that can be exemplified in all spheres and domains of reality. It is a dynamic processual and non substantial ontology in which all entities can be treated as transformations and in which objects are merely the sources and aims of these transformations. Thus in a rather surprising way when employed as a formal ontology, category theory can unite seemingly disparate disciplines in contemporary science and the humanities such as physics, mathematics and philosophy but also computer and complex systems science.

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