An Introduction To K Theory For C Algebras
The $K$-book-Charles A. Weibel 2013-06-13 Informally, $K$-theory is a tool for probing the structure of a mathematical object such as a ring or a topological space in terms of suitably parameterized vector spaces and producing important intrinsic invariants which are useful in the study of algebra.

An Introduction to Rings and Modules-A. J. Berrick 2000-05 This is a concise 2000 introduction at graduate level to ring theory, module theory and number theory.

Introduction to Algebraic K-theory-John R. Silvester 1981

Algebraic K-Theory-Max Karoubi 2009-11-27 From the Preface: K-theory was introduced by A. Grothendieck in his formulation of the Riemann-Roch theorem. For each projective algebraic variety, Grothendieck constructed a group from the category of coherent algebraic sheaves, and showed that it had many nice properties. Atiyah and Hirzebruch considered a topological analog defined for any compact space $X$, a group $K(X)$ constructed from the category of vector bundles on $X$. It is this "topological K-theory" that this book will study. Topological K-theory has become an important tool in topology. Using K-theory, Adams and Atiyah were able to give a simple proof that the only spheres which can be provided with H-space structures are $S^1$, $S^3$ and $S^7$.

Moreover, it is possible to derive a substantial part of stable homotopy theory from K-theory. The purpose of this book is to provide advanced students and mathematicians in other fields with the fundamental material in this subject. In addition, several applications of the type described above are included. In general we have tried to make this book self-contained, beginning with elementary concepts wherever possible; however, we assume that the reader is familiar with the basic definitions of homotopy theory: homotopy classes of maps and homotopy groups. Thus this book might be regarded as a fairly self-contained introduction to a "generalized cohomology theory".

An Introduction to K-Theory for C*-Algebras-M. Rørdam 2000-07-20 This book provides a very elementary introduction to K-theory for C*-algebras, and is ideal for beginning graduate students.


The $K$-$S$-book-Charles A. Weibel 2013-06-13 Informally, $K$-$S$-theory is a tool for probing the structure of a mathematical object such as a ring or a topological space in terms of suitably parameterized vector spaces and producing important intrinsic invariants which are useful in the study of algebra.

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Algebraic K-Theory-Vasudevan Srinivas 2007-11-13 Algebraic K-Theory has become an increasingly active area of research. With its connections to algebra, algebraic geometry, topology, and number theory, it has implications for a wide variety of researchers and students in mathematics. This book is based on lectures given by the author at the Tata Institute in Bombay and elsewhere. This new edition includes an appendix on algebraic geometry that contains required definitions and results needed to understand the core of the book.

Algebraic K-Theory and Its Applications-Jonathan Rosenberg 2012-12-06 Algebraic K-Theory is crucial in many areas of modern mathematics, especially algebraic topology, number theory, algebraic geometry, and operator theory. This text is designed to help graduate students in other areas learn the basics of K-Theory and get a feel for its many applications. Topics include algebraic topology, homological algebra, algebraic number theory, and an introduction to cyclic homology and its interrelationship with K-Theory.

Cohomology of Groups and Algebraic K-theory-Lizhen Ji 2010 ALM Published jointly by International Press and by Higher Education Press of China, the Advanced Lectures in Mathematics (ALM) series brings the latest mathematical developments worldwide to both researchers and students. Each volume consists of either an expository monograph or a collection of significant introductions to important topics. The ALM series emphasizes discussion of the history and significance of each topic discussed, with an overview of the current status of research, and presentation of the newest cutting-edge results. Cohomology of Groups and Algebraic K-theory Cohomology of groups is a fundamental tool in many subjects of modern mathematics. One important generalized cohomology theory is the algebraic K-theory. Indeed, algebraic K-groups of rings are important invariants of the rings and have played important roles in algebra, topology, number theory, etc.

This volume consists of expanded lecture notes from a 2007 seminar at Zhejiang University in China, at which several leading experts presented introductions, to and surveys of, many aspects of cohomology of groups and algebraic K-theory, along with their broad applications. Two foundational papers on algebraic K-theory by Daniel Quillen are also included.

Mixed Motives and Algebraic K-Theory-Uwe Jannsen 1990-02-07 The relations that could or should exist between algebraic cycles, algebraic K-theory, and the cohomology of - possibly singular - varieties, are the topic of investigation of this book. The author proceeds in an axiomatic way, combining the concepts of twisted Poincaré duality theories, weights, and tensor categories. One thus arrives at generalizations to arbitrary varieties of the Hodge and Tate conjectures to explicit conjectures on l-adic Chern characters for global fields and to certain counterexamples for more general fields. It is to be hoped that these relations will in due course be explained by a suitable tensor category of mixed motives. An approximation to this is constructed in
the setting of absolute Hodge cycles, by extending this theory to arbitrary varieties. The book can serve both as a guide for the researcher, and as an introduction to these ideas for the non-expert, provided (s)he knows or is willing to learn about K-theory and the standard cohomology theories of algebraic varieties.

L2-Invariants: Theory and Applications to Geometry and K-Theory-Wolfgang Lück 2013-03-09 In algebraic topology some classical invariants - such as Betti numbers and Reidemeister torsion - are defined for compact spaces and finite group actions. They can be generalized using von Neumann algebras and their traces, and applied also to non-compact spaces and infinite groups. These new L2-invariants contain very interesting and novel information and can be applied to problems arising in topology, K-Theory, differential geometry, non-commutative geometry and spectral theory. The book, written in an accessible manner, presents a comprehensive introduction to this area of research, as well as its most recent results and developments.

An Introduction to K-theory for C*-algebras-Mikael Rørdam 2000 "Over the last 25 years K-theory has become an integrated part of the study of C*-algebras. This book gives an elementary introduction to this interesting and rapidly growing area of mathematics.

An Algebraic Introduction to K-Theory-Bruce A. Magurn 2002-05-20 This is an introduction to algebraic K-theory, focusing on the study of rings, although we will give some geometric interpretations and some relations to topological K-theory. We will study the $K_0$ group. The first two chapters of the thesis include some basic notions of rings and modules, and category theory, especially regarding abelian categories. Afterwards, we present projective modules and their properties, that will be used to define the $K_0$ group in Chapter 4. This chapter will include basic definitions and the main theorems of the Grothendieck group of a ring. We will also show some relations with vector bundles and topological K-theory. The last chapter introduces the $K_0$ group of a category with exact sequences and the $G_0$ group. It includes the proofs of three important abstract theorems about $K_0$ and the Fundamental Theorem of $G_0$.

An Algebraic Introduction to K-Theory-Bruce A. Magurn 2002-05-20 This is an introduction to algebraic K-theory with no prerequisite beyond a first semester of algebra (including Galois theory and modules over a principal ideal domain). The presentation is almost entirely self-contained, and is divided into short sections with exercises to reinforce the ideas and suggest further lines of inquiry. No experience with analysis, geometry, number theory or topology is assumed. Within the context of linear algebra, K-theory organises and clarifies the relations among ideal class groups, group representations, quadratic forms, dimensions of a ring, determinants, quadratic reciprocity and Brauer groups of fields. By including introductions to standard algebra topics (tensor products, localisation, Jacobson radical, chain conditions, Dedekind domains, semi-simple rings, exterior algebras), the author makes algebraic K-theory accessible to first-year graduate students and other mathematically sophisticated readers. Even if your algebra is rusty, you can read this book; the necessary background is here, with proofs.

Introduction to K-theory-Max Karoubi 1967

An Introduction to K-theory for C*-algebras-Niels Erik Wegge-Olsen 1993 K-theory is often considered a complicated mathematical theory for specialists only. This book is an accessible introduction to the basics and provides detailed explanations of the various concepts required for a deeper understanding of the subject. Some familiarity with basic C*-algebra theory is assumed. The book then follows a careful construction and analysis of the operator K-theory groups and proof of the results of K-theory, including Bott periodicity. Of specific interest to algebraists and geometers, the book aims to give full instruction. No details are left out in the presentation and many instructive and generously hinted exercises are provided. Apart from K-theory, this book offers complete and self contained expositions of important advanced C*-algebraic constructions like tensor products, multiplier algebras and Hilbert modules.

An Introduction to K-theory for C*-algebras-Mikael Rørdam 2000 "Over the last 25 years K-theory has become an integrated part of the study of C*-algebras. This book gives an elementary introduction to this interesting and rapidly growing area of mathematics.

Introduction to Algebraic K-theory-Elias Milnor 1971 Algebraic K-theory describes a branch of algebra that centers about two functors. $K_0$ and $K_1$, which assign to each associative ring a an abelian group $K_0 a$ or $K_1 a$ respectively. Professor Milnor sets out, in the present work, to define and study an analogous functor $K_2$, also from associative rings to abelian groups. Just as functors $K_0$ and $K_1$ are important to geometric topologists, $K_2$ is now considered to have similar topological applications. The exposition includes, besides K-theory, a considerable amount of related arithmetic.

K-theory and C*-algebras-Niels Erik Wegge-Olsen 1993 K-theory is often considered a complicated mathematical theory for specialists only. This book is an accessible introduction to the basics and provides detailed explanations of the various concepts required for a deeper understanding of the subject. Some familiarity with basic C*-algebra theory is assumed. The book then follows a careful construction and analysis of the operator K-theory groups and proof of the results of K-theory, including Bott periodicity. Of specific interest to algebraists and geometers, the book aims to give full instruction. No details are left out in the presentation and many instructive and generously hinted exercises are provided. Apart from K-theory, this book offers complete and self contained expositions of important advanced C*-algebraic constructions like tensor products, multiplier algebras and Hilbert modules.
An Introduction to the Classification of Amenable C*-algebras-Huaxin Lin 2001
The theory and applications of C Oeu -algebras are related to fields ranging from operator theory, group representations and quantum mechanics, to non-commutative geometry and dynamical systems. By Gelfand transformation, the theory of C Oeu -algebras is also regarded as non-commutative topology. About a decade ago, George A. Elliott initiated the program of classification of C Oeu -algebras (up to isomorphism) by their K -theoretical data. It started with the classification of AT -algebras with real rank zero. Since then great efforts have been made to classify amenable C Oeu -algebras, a class of C Oeu -algebras that arises most naturally. For example, a large class of simple amenable C Oeu -algebras is discovered to be classifiable. The application of these results to dynamical systems has been established. This book introduces the recent development of the theory of the classification of amenable C Oeu -algebras OCo the first such attempt. The first three chapters present the basics of the theory of C Oeu -algebras which are particularly important to the theory of the classification of amenable C Oeu -algebras. Chapter 4 otters the classification of the so-called AT -algebras of real rank zero. The first four chapters are self-contained, and can serve as a text for a graduate course on C Oeu -algebras. The last two chapters contain more advanced material. In particular, they deal with the classification theorem for simple AH -algebras with real rank zero, the work of Elliott and Gong. The book contains many new proofs and some original results related to the classification of amenable C Oeu -algebras. Besides being an introduction to the theory of the classification of amenable C Oeu -algebras, it is a comprehensive reference for those more familiar with the subject. Sample Chapter(s). Chapter 1.1: Banach algebras (260 KB). Chapter 1.2: C*-algebras (210 KB). Chapter 1.3: Commutative C*-algebras (212 KB). Chapter 1.4: Positive cones (207 KB). Chapter 1.5: Approximate identities, hereditary C*-subalgebras and quotients (230 KB). Chapter 1.6: Positive linear functionals and a Gelfand-Naimark theorem (235 KB). Chapter 1.7: Von Neumann algebras (234 KB). Chapter 1.8: Enveloping von Neumann algebras and the spectral theorem (217 KB). Chapter 1.9: Examples of C*-algebras (270 KB). Chapter 1.10: Inductive limits of C*-algebras (252 KB). Chapter 1.11: Exercises (220 KB). Chapter 1.12: Addenda (168 KB). Contents: The Basics of C Oeu -Algebras; Amenable C Oeu -Algebras and K -Theory; AF- Algebras and Ranks of C Oeu -Algebras; Classification of Simple AT -Algebras; C Oeu -Algebra Extensions; Classification of Simple Amenable C Oeu -Algebras. Readership: Researchers and graduate students in operator algebras.

Introduction to Some Methods of Algebraic K-theory-Hyman Bass 1979

Introduction to the Baum-Connes Conjecture-Alain Valette 2002-04-01
The Baum-Connes conjecture is part of A. Connes' non-commutative geometry programme. It can be viewed as a conjectural generalisation of the Atiyah-Singer index theorem, to the equivariant setting (the ambient manifold is not compact, but some compactness is restored by means of a proper, co-compact action of a group "gamma"). Like the Atiyah-Singer theorem, the Baum-Connes conjecture states that a purely topological object coincides with a purely analytical one. For a given group "gamma", the topological object is the equivariant K-homology of the classifying space for proper actions of "gamma", while the analytical object is the K-theory of the C*-algebra associated with "gamma" in its regular representation. The Baum-Connes conjecture implies several other classical conjectures, ranging from differential topology to pure algebra. It has also strong connections with geometric group theory, as the proof of the conjecture for a given group "gamma" usually depends heavily on geometric properties of "gamma". This book is intended for graduate students and researchers in geometry (commutative or not), group theory, algebraic topology, harmonic analysis, and operator algebras. It presents, for the first time in book form, an introduction to the Baum-Connes conjecture. It starts by defining carefully the objects in both sides of the conjecture, then the assembly map which connects them. Thereafter it illustrates the main tool to attack the conjecture (Kasparov's theory), and it concludes with a rough sketch of V. Lafforgue's proof of the conjecture for co-compact lattices in in Spn1, SL(3R), and SL(3C).

Complex Topological K-Theory-Efton Park 2008-03-13
Topological K-theory is a key tool in topology, differential geometry and index theory, yet this is the first contemporary introduction for graduate students new to the subject. No background in algebraic topology is assumed; the reader need only have taken the standard first courses in real analysis, abstract algebra, and point-set topology. The book begins with a detailed discussion of vector bundles and related algebraic notions, followed by the definition of K-theory and proofs of the most important theorems in the subject, such as the Bott periodicity theorem and the Thom isomorphism theorem. The multiplicative structure of K-theory and the Adams operations are also discussed and the final chapter details the construction and computation of characteristic classes. With every important aspect of the topic covered, and exercises at the end of each chapter, this is the definitive book for a first course in topological K-theory.

Studyguide for an Algebraic Introduction to K-Theory by Bruce A. Magurn, ISBN 9780521800785-Cram101
Informal 'wisdom' rather than only the precise definitions. As a number of results are due to the authors, one theory. Both are enlivened by examples related to groups...An attractive feature is the attempt to convey some contained...There is a nice introduction to symplectic geometry and a charming exposition of equivariant K-

An Introduction to Noncommutative Geometry-Joseph C. Várilly 2006 Noncommutative geometry, inspired by mathematical physics, describes singular spaces by their noncommutative coordinate algebras and metric structures by Dirac-like operators. Such metric geometries are described mathematically by Connes' theory of spectral triples. These lectures, delivered at an EMS Summer School on noncommutative geometry and its applications, provide an overview of spectral triples based on examples. This introduction is aimed at graduate students of both mathematics and theoretical physics. It deals with Dirac operators on spin manifolds, noncommutative tori, Moyal quantization and tangent groupoids, action functionals, and isospectral deformations. The structural framework is the concept of a noncommutative spin geometry; the conditions on spectral triples which determine this concept are developed in detail. The emphasis throughout is on gaining understanding by computing the details of specific examples. The book provides a middle ground between a comprehensive text and a narrowly focused research monograph. It is intended for self-study, enabling the reader to gain access to the essentials of noncommutative geometry. New features since the original course appear certain that these two branches of mathematics have become deeply and permanently intertwined. Despite the fact that the whole subject is only about a decade old, operator K-theory has now reached a state of relative stability. While there will undoubtedly be many more revolutionary developments and applications in the future, it appears the basic theory has more or less reached a "final form." But because of the newness of the theory, there has so far been no comprehensive treatment of the subject. It is the ambitious goal of these notes to fill this gap. We will develop the K-theory of Banach algebras, the theory of extensions of C*-algebras, and the operator K-theory of Kasparov from scratch to its most advanced aspects. We will not treat applications in detail; however, we will outline the most striking of the applications to date in a section at the end, as well as mentioning others at suitable points in the text.

Higher Algebraic K-Theory: An Overview-Emilio Lluis-Puebla 2006-11-14 This book is a general introduction to Higher Algebraic K-groups of rings and algebraic varieties, which were first defined by Quillen at the beginning of the 70’s. These K-groups happen to be useful in many different fields, including topology, algebraic geometry, algebra and number theory. The goal of this volume is to provide graduate students, teachers and researchers with basic definitions, concepts and results, and to give a sampling of current directions of research. Written by five specialists of different parts of the subject, each set of lectures reflects the particular perspective of its author. As such, this volume can serve as a primer (if not as a technical textbook) for mathematicians from many different fields of interest.

K-Theory for Operator Algebras-Bruce Blackadar 2011-12-14 K-theory has revolutionized the study of operator algebras in the last few years. As the primary component of the subject of "noncommutative topology," K-theory has opened vast new vistas within the structure theory of C*-algebras, as well as leading to profound and unexpected applications of operator algebras to problems in geometry and topology. As a result, many topologists and operator algebraists have feverishly begun trying to learn each others’ subjects, and it appears certain that these two branches of mathematics have become deeply and permanently intertwined. Despite the fact that the whole subject is only about a decade old, operator K-theory has now reached a state of relative stability. While there will undoubtedly be many more revolutionary developments and applications in the future, it appears the basic theory has more or less reached a "final form." But because of the newness of the theory, there has so far been no comprehensive treatment of the subject. It is the ambitious goal of these notes to fill this gap. We will develop the K-theory of Banach algebras, the theory of extensions of C*-algebras, and the operator K-theory of Kasparov from scratch to its most advanced aspects. We will not treat applications in detail; however, we will outline the most striking of the applications to date in a section at the end, as well as mentioning others at suitable points in the text.
finds some of the original excitement. This is the only available introduction to geometric representation theory...it has already proved successful in introducing a new generation to the subject." (Bulletin of the AMS)

Orbifolds and Stringy Topology-Alejandro Adem 2007-05-31 An introduction to the theory of orbifolds from a modern perspective, combining techniques from geometry, algebraic topology and algebraic geometry. One of the main motivations, and a major source of examples, is string theory, where orbifolds play an important role. The subject is first developed following the classical description analogous to manifold theory, after which the book branches out to include the useful description of orbifolds provided by groupoids, as well as many examples in the context of algebraic geometry. Classical invariants such as de Rham cohomology and bundle theory are developed, a careful study of orbifold morphisms is provided, and the topic of orbifold K-theory is covered. The heart of this book, however, is a detailed description of the Chen-Ruan cohomology, which introduces a product for orbifolds and has had significant impact. The final chapter includes explicit computations for a number of interesting examples.

An Introduction to Homological Algebra-Joseph Rotman 2008-11-25 Graduate mathematics students will find this book an easy-to-follow, step-by-step guide to the subject. Rotman’s book gives a treatment of homological algebra which approaches the subject in terms of its origins in algebraic topology. In this new edition the book has been updated and revised throughout and new material on sheaves and cup products has been added. The author has also included material about homotopical algebra, alias K-theory. Learning homological algebra is a two-stage affair. First, one must learn the language of Ext and Tor. Second, one must be able to compute these things with spectral sequences. Here is a work that combines the two.

Higher Algebraic K-Theory: An Overview-Emilio Lluis-Puebla 1992-03-25 This book is a general introduction to Higher Algebraic K-groups of rings and algebraic varieties, which were first defined by Quillen at the beginning of the 70’s. These K-groups happen to be useful in many different fields, including topology, algebraic geometry, algebra and number theory. The goal of this volume is to provide graduate students, teachers and researchers with basic definitions, concepts and results, and to give a sampling of current directions of research. Written by five specialists of different parts of the subject, each set of lectures reflects the particular perspectives of its author. As such, this volume can serve as a primer (if not as a technical basic textbook) for mathematicians from many different fields of interest.

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