

G. Kosniowski

A first course in algebraic topology



First Course In Algebraic Topology

Tammo tom Dieck



First Course In Algebraic Topology:

A First Course in Algebraic Topology A. Lahiri, B. K. Lahiri, 2000 This volume is an introductory text where the subject matter has been presented lucidly so as to help self study by the beginners New definitions are followed by suitable illustrations and the proofs of the theorems are easily accessible to the readers Sufficient number of examples have been incorporated to facilitate clear understanding of the concepts The book starts with the basic notions of category functors and homotopy of continuous mappings including relative homotopy Fundamental groups of circles and torus have been treated along with the fundamental group of covering spaces Simplexes and complexes are presented in detail and two homology theories simplicial homology and singular homology have been considered along with calculations of some homology groups

Algebraic Topology William Fulton, 1997-09-05 To the Teacher This book is designed to introduce a student to some of the important ideas of algebraic topology by emphasizing the relations of these ideas with other areas of mathematics Rather than choosing one point of view of modern topology homotopy theory simplicial complexes singular theory axiomatic homology differential topology etc we concentrate our attention on concrete problems in low dimensions introducing only as much algebraic machinery as necessary for the problems we meet This makes it possible to see a wider variety of important features of the subject than is usual in a beginning text The book is designed for students of mathematics or science who are not aiming to become practicing algebraic topologists without we hope discouraging budding topologists We also feel that this approach is in better harmony with the historical development of the subject What would we like a student to know after a first course in topology assuming we reject the answer half of what one would like the student to know after a second course in topology Our answers to this have guided the choice of material which includes understanding the relation between homology and integration first on plane domains later on Riemann surfaces and in higher dimensions winding numbers and degrees of mappings fixed point theorems applications such as the Jordan curve theorem invariance of domain in dices of vector fields and Euler characteristics fundamental groups

A Basic Course in Algebraic Topology William S. Massey, 2019-06-28 This textbook is intended for a course in algebraic topology at the beginning graduate level The main topics covered are the classification of compact 2 manifolds the fundamental group covering spaces singular homology theory and singular cohomology theory These topics are developed systematically avoiding all unnecessary definitions terminology and technical machinery The text consists of material from the first five chapters of the author's earlier book *Algebraic Topology an Introduction* GTM 56 together with almost all of his book *Singular Homology Theory* GTM 70 The material from the two earlier books has been substantially revised corrected and brought up to date

A First Course in Algebraic Topology Czes Kosniowski, 1980-09-25 This self contained introduction to algebraic topology is suitable for a number of topology courses It consists of about one quarter general topology without its usual pathologies and three quarters algebraic topology centred around the fundamental group a readily grasped topic which gives a good idea of what algebraic

topology is The book has emerged from courses given at the University of Newcastle upon Tyne to senior undergraduates and beginning postgraduates It has been written at a level which will enable the reader to use it for self study as well as a course book The approach is leisurely and a geometric flavour is evident throughout The many illustrations and over 350 exercises will prove invaluable as a teaching aid This account will be welcomed by advanced students of pure mathematics at colleges and universities *Algebraic Topology* Marvin J. Greenberg, 2018-03-05 Great first book on algebraic topology Introduces co homology through singular theory *More Concise Algebraic Topology* J. P. May, K. Ponto, 2011-12-05 With firm foundations dating only from the 1950s algebraic topology is a relatively young area of mathematics There are very few textbooks that treat fundamental topics beyond a first course and many topics now essential to the field are not treated in any textbook J Peter May's *A Concise Course in Algebraic Topology* addresses the standard first course material such as fundamental groups covering spaces the basics of homotopy theory and homology and cohomology In this sequel May and his coauthor Kathleen Ponto cover topics that are essential for algebraic topologists and others interested in algebraic topology but that are not treated in standard texts They focus on the localization and completion of topological spaces model categories and Hopf algebras The first half of the book sets out the basic theory of localization and completion of nilpotent spaces using the most elementary treatment the authors know of It makes no use of simplicial techniques or model categories and it provides full details of other necessary preliminaries With these topics as motivation most of the second half of the book sets out the theory of model categories which is the central organizing framework for homotopical algebra in general Examples from topology and homological algebra are treated in parallel A short last part develops the basic theory of bialgebras and Hopf algebras **FIRST COURSE IN ALGEBRAIC TOPOLOGY.** C. KOSNIOWSKI, 1980 **Homology Theory** Sze Tsen Hu, 1966 *Homology Theory: a First Course in Algebraic Topology* Sze-cen Hu, 1966 A Concise Course in Algebraic Topology J. P. May, 1999-09 Algebraic topology is a basic part of modern mathematics and some knowledge of this area is indispensable for any advanced work relating to geometry including topology itself differential geometry algebraic geometry and Lie groups This book provides a detailed treatment of algebraic topology both for teachers of the subject and for advanced graduate students in mathematics either specializing in this area or continuing on to other fields J Peter May's approach reflects the enormous internal developments within algebraic topology over the past several decades most of which are largely unknown to mathematicians in other fields But he also retains the classical presentations of various topics where appropriate Most chapters end with problems that further explore and refine the concepts presented The final four chapters provide sketches of substantial areas of algebraic topology that are normally omitted from introductory texts and the book concludes with a list of suggested readings for those interested in delving further into the field **Algebraic Topology** Max K. Agoston, 1976 *Algebraic Topology* Allen Hatcher, 2002 In most mathematics departments at major universities one of the three or four basic first year graduate courses is in the subject of algebraic

topology This introductory textbook in algebraic topology is suitable for use in a course or for self study featuring broad coverage of the subject and a readable exposition with many examples and exercises The four main chapters present the basic material of the subject fundamental group and covering spaces homology and cohomology higher homotopy groups and homotopy theory generally The author emphasizes the geometric aspects of the subject which helps students gain intuition A unique feature of the book is the inclusion of many optional topics which are not usually part of a first course due to time constraints and for which elementary expositions are sometimes hard to find Among these are Bockstein and transfer homomorphisms direct and inverse limits H spaces and Hopf algebras the Brown representability theorem the James reduced product the Dold Thom theorem and a full exposition of Steenrod squares and powers Researchers will also welcome this aspect of the book **Algebraic Topology** Marvin J. Greenberg, John R. Harper, 1981 **Homology Theory**, 1966 **A User's Guide to Algebraic Topology** C.T. Dodson, P.E. Parker, 1997-02-14 We have tried to design this book for both instructional and reference use during and after a first course in algebraic topology aimed at users rather than developers indeed the book arose from such courses taught by the authors We start gently with numerous pictures to illustrate the fundamental ideas and constructions in homotopy theory that are needed in later chapters A certain amount of redundancy is built in for the reader's convenience we hope to minimize flipping back and forth and we have provided some appendices for reference The first three are concerned with background material in algebra general topology manifolds geometry and bundles Another gives tables of homotopy groups that should prove useful in computations and the last outlines the use of a computer algebra package for exterior calculus Our approach has been that whenever a construction from a proof is needed we have explicitly noted and referenced this In general we have not given a proof unless it yields something useful for computations As always the only way to understand mathematics is to do it and use it To encourage this Ex denotes either an example or an exercise The choice is usually up to you the reader depending on the amount of work you wish to do however some are explicitly stated as unanswered questions In such cases our implicit claim is that you will greatly benefit from at least thinking about how to answer them First Course In Algebraic Topology 2e B. K. Lahiri, 2005 Fundamentals of Algebraic Topology Steven H. Weintraub, 2014-10-31 This rapid and concise presentation of the essential ideas and results of algebraic topology follows the axiomatic foundations pioneered by Eilenberg and Steenrod The approach of the book is pragmatic while most proofs are given those that are particularly long or technical are omitted and results are stated in a form that emphasizes practical use over maximal generality Moreover to better reveal the logical structure of the subject the separate roles of algebra and topology are illuminated Assuming a background in point set topology Fundamentals of Algebraic Topology covers the canon of a first year graduate course in algebraic topology the fundamental group and covering spaces homology and cohomology CW complexes and manifolds and a short introduction to homotopy theory Readers wishing to deepen their knowledge of algebraic topology beyond the fundamentals are guided by a short but

carefully annotated bibliography Algebraic Topology Tammo tom Dieck, 2008 This book is written as a textbook on algebraic topology The first part covers the material for two introductory courses about homotopy and homology The second part presents more advanced applications and concepts duality characteristic classes homotopy groups of spheres bordism The author recommends starting an introductory course with homotopy theory For this purpose classical results are presented with new elementary proofs Alternatively one could start more traditionally with singular and axiomatic homology Additional chapters are devoted to the geometry of manifolds cell complexes and fibre bundles A special feature is the rich supply of nearly 500 exercises and problems Several sections include topics which have not appeared before in textbooks as well as simplified proofs for some important results Prerequisites are standard point set topology as recalled in the first chapter elementary algebraic notions modules tensor product and some terminology from category theory The aim of the book is to introduce advanced undergraduate and graduate master's students to basic tools concepts and results of algebraic topology Sufficient background material from geometry and algebra is included **A First Course in Topology** John McCleary, 2006 How many dimensions does our universe require for a comprehensive physical description In 1905 Poincaré argued philosophically about the necessity of the three familiar dimensions while recent research is based on 11 dimensions or even 23 dimensions The notion of dimension itself presented a basic problem to the pioneers of topology Cantor asked if dimension was a topological feature of Euclidean space To answer this question some important topological ideas were introduced by Brouwer giving shape to a subject whose development dominated the twentieth century The basic notions in topology are varied and a comprehensive grounding in point set topology the definition and use of the fundamental group and the beginnings of homology theory requires considerable time The goal of this book is a focused introduction through these classical topics aiming throughout at the classical result of the Invariance of Dimension This text is based on the author's course given at Vassar College and is intended for advanced undergraduate students It is suitable for a semester long course on topology for students who have studied real analysis and linear algebra It is also a good choice for a capstone course senior seminar or independent study *Representations of Compact Lie Groups* T. Bröcker, T. tom Dieck, 2003-06-02 This introduction to the representation theory of compact Lie groups follows Herman Weyl's original approach It discusses all aspects of finite dimensional Lie theory consistently emphasizing the groups themselves Thus the presentation is more geometric and analytic than algebraic It is a useful reference and a source of explicit computations Each section contains a range of exercises and 24 figures help illustrate geometric concepts

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