A number of bodies linked by joints form a kinematic chain. On the basis of the presence of loops in a mechanical structure it can be distinguished closed kinematic chains, if there are one or more loops so that each link and each joint is contained in at least one of them. A closed kinematic chain have no open attachment point. An open kinematic chain contains no loop. Kinematic chains design is a vital component of modern machine design practice. Kinematic chains are used to transmit forces and moments and to manipulate objects. A knowledge of the kinematic and dynamic properties of these machines is crucial for their design and control. A feature of this book and its main distinction from other books is that it presents a different method for kinematic and dynamic force analysis of kinematic chains. The other important feature of the approach used here is the attention given to the solution of the problems using the symbolical software Mathematica. Methods, algorithms and software packages for the solution of classical mechanical problems are presented. The book presents texts that are teachable and computer-oriented.

The book will assist all those interested in the design of mechanisms, manipulators, building machines, textile machines, vehicles, aircraft, satellites, ships, biomechanical systems (vehicle simulators, barrier tests, human motion studies, etc.), controlled mechanical systems, mechatronical devices and many others.

This book is appropriate for use as a text for undergraduate or graduate courses in mechanical engineering dealing with the subjects of the analysis and design of mechanisms, vehicle dynamics, mechatronics and multibody systems and machine components design. A basic knowledge of mechanics and calculus is assumed. The book may also be useful for practicing engineers and researchers in the fields of machine design and dynamics, and also biomechanics and mechatronics.