



## BOOK REVIEW

*Analytical Mechanics. A Comprehensive Treatise on the Dynamics of Constrained Systems*, by John G. Papastavridis, World Scientific, Singapore 2014, xxiv + 1392pp ISBN 978-981-4338-71-4.

More or less the reviewer shares the author's statement with which he starts the *Preface*, that this book with its almost 1 400 pages is unique among the comparable treatises in the breadth and the depth of the covered material. Since that place the author initiate a heart-to-heart talk on philosophy of teaching of mechanics and the social aspects of the professional societies.

The main motivation for the book should be looked at advocated here clear distinction between analytical mechanics of Lagrange and that one which the author calls also analytical but momentum founded by Euler. It is designed for peoples who are not interested just in collection of particular problems but are eager for a real understanding of the fundamental principles.

Specifically, the *Introduction*, presents a brief history of theoretical mechanics, gives suggestions to the readers and a list of symbols and notation, abbreviations, and basic formulas.

Chapter one - *Background*, introduces vector and tensor algebra, basic concepts and equations of Newton-Euler mechanics of particles and rigid bodies. Geometry of rigid body motion and kinematics and geometry of rotation motions are considered in details.

Chapter two - *Kinematics of Constrained Systems*, i.e., Lagrangean kinematics, introduces the theory of constrained systems and the classification of constrains. The holonomic and nonholonomic constraints are presented.

Together with the third Chapter - *Kinetics of Constrained Systems*, i.e., Lagrangean kinetics, they both are the most important chapters in the book. Here, the fundamental principles of the analytical mechanics are included, that is, those of d'Alembert-Lagrange and relaxation of the constraints; the central equations of Hamel; equations of motion with or without reactions, with or without multipliers,