BOOK REVIEW

*A*pplied Dynamics, by Haim Baruh, CRC Press, Taylor & Francis Group, Boca Raton 2015, xxii+850 pp., ISBN 978-1-4822-5073-2.

The book is a classical and detailed introduction to the applied engineering dynamics and it is also a nice treatise on the analytical mechanics - holonomic and non-holonomic mechanical systems, especially kinematics and dynamics of the rigid bodies and vehicle dynamics. As the author himself had declared - it is a material to teach dynamics and its applications where the examples are primarily from real-world situations. The book is structured in fifteenth chapters and an Appendix.

Chapter one - *Introductory Concepts*, presents the basic definitions and classifications for the study of mechanical motion like: system, objects as particles, rigid bodies and deformable bodies, degrees of freedom, constraints, generalized coordinates, types of forces and motions, systems of units, linearization of the differential equations (viewed as a basis for application of the superposition principle) and their numerical integration.

Chapter two - *Kinematics Fundamentals*, presents the pure kinematics of motion without examining the forces that cause the motion. It is focussed on the two- and three-dimensional kinematics of particles and the planar kinematics of rigid bodies. Three dimensional kinematics of a rigid body is presented in Chapter 9. Rotational parameters are introduced in two ways. In the first approach these are the angles of rotations about three axes. The second approach is based on Euler's theorem, which states that the most general transformation of a rigid body with one fixed point can be described as a single rotation about some axis through the fixed point. The respective rotation angle is called the principle angle and the Rodrigues formula (i.e., the matrix presenting the rotation) is derived geometrically. The definitions of the angular velocity and angular acceleration vectors needed to describe the general rotational motions are also considered here.

Chapter three - *Kinematics Applications*, extends the kinematics knowledge of the previous chapter to applications of interest for engineers and scientists working in the area of applied mechanics. The motion with respect to the rotating Earth is considered. Contact between two bodies is discussed and the most important