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| | ISBN | 3-030-11745-6 |
| | Edizione | [3rd ed. 2019.] |
| | Descrizione fisica | 1 online resource (XVIII, 299 p. 186 illus., 105 illus. in color.) |
| | Disciplina | 531.11<br>620.105 |
| | Soggetti | Applied mathematics<br>Engineering mathematics<br>Mechanics<br>Mechanics, Applied<br>Applications of Mathematics<br>Solid Mechanics<br>Classical Mechanics |
| | Lingua di pubblicazione | Inglese |
| | Formato | Materiale a stampa |
| | Livello bibliografico | Monografia |
| | Nota di contenuto | Part I: Dynamics of a Single Particle -- Chapter 1: Elementary Particle Dynamics -- Chapter 2: Particles and Cylindrical Polar Coordinates -- Chapter 3: Particles and Space Curves -- Chapter 4: Friction Forces and Spring Forces -- Chapter 5: Power, Work, and Energy -- Part II: Dynamics of a System of Particles -- Chapter 6: Momenta, Impulses, and Collisions -- Chapter 7: Dynamics of Systems of Particles -- Part III: Dynamics of a Single Rigid Bodies -- Chapter 8: Planar Kinematics of Rigid Bodies -- Chapter 9: Kinetics of a Rigid Body -- Part IV: Dynamics of Systems of Particles and Rigid Bodies -- Chapter 10: Systems of Particles and Rigid Bodies -- Appendix A: Preliminaries on Vectors and Calculus -- Appendix B: Weekly Course Content and Notation in Other Texts. |
| | Sommario/riassunto | This primer is intended to provide the theoretical background for the standard undergraduate, mechanical engineering course in dynamics. Representative problems are discussed and simulated throughout the book to illustrate fundamental concepts and explore the development |

of mathematical models for mechanical systems. The text grew out of the author's desire to provide a complement to traditional texts on the subject and promote a systematic approach to problem solving. For all the examples discussed in the primer, a systematic four-step approach is employed. The third edition of the text has been revised in response to student comments on earlier editions and the increased availability of simulation software. The revisions include the addition of several new examples of models for the dynamics of systems ranging from an aerosol spray to a spherical robot. The primer has three intended audiences: undergraduate students enrolled in an introductory course on engineering dynamics, graduate students who are interesting in refreshing their knowledge, and instructors. Oliver M. O'Reilly is a professor of mechanical engineering at the University of California, Berkeley. He has taught at this institution since 1992 and received multiple teaching awards including the Distinguished Teaching Award of the University of California, Berkeley. He is the author of two other textbooks and coauthor of a research monograph on discrete elastic rods. The author's research interest lie in a variety of topics including the dynamics of soft robots, rotations of rigid bodies, mathematical models for the mechanics of plant growth, the dynamics of toys, and the failure of shoelace knots. Review of Second Edition: "The book is carefully written and provides a good introduction to the subject. The main objective of this primer is to reduce the gap between the theoretical framework and an undergraduate student's ability to solve typical problems of undergraduate dynamics. Well-selected problems illustrate a systematic four-step methodology for solving problems from the dynamics of single particles, of systems of particles, of a single rigid body, and of a system of particles and rigid bodies. … At the end of each chapter some illustrative examples were added." - Franz Selig, Zentralblatt MATH, Vol. 1201, 2011.