

Lecture notes on theoretical mechanics

Liu, Jianlin, author

Deskripsi Lengkap: <https://lib.ui.ac.id/detail?id=9999920521886&lokasi=lokal>

Abstrak

This book addresses a range of basic and essential topics, selected from the author's teaching and research activities, offering a comprehensive guide in three parts: Statics, Kinematics and Kinetics. Chapter 1 briefly discusses the history of classical and modern mechanics, while Chapter 2, presents preliminary knowledge, preparing readers for the subsequent chapters. Chapters 3 to 7 introduce statics, force analysis, simplification of force groups, equilibrium of the general coplanar force group, and the center of the parallel force group.

The Kinematics section (Chapters 8 to 10), covers the motion of a particle, basic motion and planar motion of a rigid body.

Lastly, the Kinetics section (Chapters 11 to 14) explores Newton's law of motion, theorem of momentum, theorem of angular momentum, and theorem of kinetic energy.

With numerous examples from engineering, illustrations, and step-by-step tutorials, the book is suitable for both classroom use and self-study. After completing the course, students will be able to simplify complex engineering structures and perform force and motion analyses on particles and structures, preparing them for further study and research.

The book can be used as a textbook for undergraduate courses on fundamental aspects of theoretical mechanics, such as aerospace, mechanical engineering, petroleum engineering, automotive and civil engineering, as well as material science and engineering.