1. Record Nr. UNINA9910810805803321

Autore	Harrison H. R
Titolo	Principles of engineering mechanics / / H.R. Harrison, T. Nettleton
Pubbl/distr/stampa	Oxford, : Butterworth Heinemann, 1994
ISBN	1-283-61934-2 9786613931795 0-08-052413-3
Edizione	[2nd ed.]
Descrizione fisica	1 online resource (281 p.)
Altri autori (Persone)	NettletonT
Disciplina	620.1
Soggetti	Mechanics, Applied
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes indexes.
Nota di contenuto	Front cover; Principles of Engineering Mechanics; Copyright Page; Table of Contents; Preface; Chapter 1. Co-ordinate systems and position vectors; 1.1 Introduction; 1.2 Co-ordinate systems; 1.3 Vector representation; Chapter 2. Kinematics of a particle in plane motion; 2.1 Displacement, velocity and acceleration of a particle; 2.2 Cartesian co-ordinates; 2.3 Path co-ordinates; 2.4 Polar co-ordinates; 2.5 Relative motion; 2.6 One-dimensional motion; 2.7 Graphical methods; Chapter 3. Kinetics of a particle in plane motion; 3.1 Introduction; 3.2 Newton's laws of motion; 3.3 Units 3.4 Types of force3.5 Gravitation; 3.6 Frames of reference; 3.7 Systems of particles; 3.8 Centre of mass; 3.9 Free-body diagrams; 3.10 Simple harmonic motion; 3.11 Impulseand momentum; 3.12 Work and kinetic energy; 3.13 Power; Chapter 4. Force systems and equilibrium; 4.1 Addition of forces; 4.2 Moment of force; 4.3 Vector product of two vectors; 4.4 Moments of components of a force; 4.5 Couple; 4.6 Distributed forces; 4.7 Equivalentforce system in three dimensions; 4.8 Equilibrium; 4.9 Co-planar force system; 4.10 Equilibrium in three dimensions; 4.11 Triple scalar product 4.12 Internal forces4.13 Fluid statics; 4.14 Buoyancy; 4.15 Stability of floating bodies; Chapter 5. Kinematics of a rigid body in plane motion; 5.1 Introduction; 5.2 Types of motion; 5.3 Relative motion between two points on a rigid body; 5.4 Velocity diagrams; 5.5 Instantaneous centre of rotation; 5.6 Velocity image; 5.7 Acceleration diagrams; 5.8

Acceleration image; 5.9 Simple spur gears; 5.10 Epicyclic motion; 5.11 Compound epicyclic gears; Chapter 6. Kinetics of a rigid body in plane motion; 6.1 General plane motion; 6.2 Rotation about a fixed axis
6.3 Moment of inertia of a body about an axis6.4 Application; Chapter 7. Energy; 7.1 Introduction; 7.2 Work and energy for a system of particles; 7.3 Kinetic energy of a rigid body; 7.4 Potential energy; 7.5 Non-conservative systems; 7.6 The general energy principle; 7.7 Summary of the energy method; 7.8 The power equation; 7.9 Virtual work; 7.10 D'Alembert's principle; Chapter 8. Momentum and impulse; 8.1 Linear momentum; 8.2 Moment of momentum; 8.3 Conservation of momentum; 8.4 Impact of rigid bodies; 8.5 Deflection of fluid streams; 8.6 The rocket in free space; 8.7 Illustrative example
8.8 Equations of motion for a fixed region of spaceChapter 9. Vibration; SECTION A: One-degree-of-freedom systems; 9.1 Introduction; 9.2 Free vibration of undamped systems; 9.3 Vibration energy; 9.4 Pendulums; 9.5 Levels of vibration; 9.6 Damping; 9.7 Free vibration of a damped system; 9.8 Phase-plane method; 9.9 Response to simple input forces; 9.10 Periodic excitation; 9.11 Work done by a sinusoidal force; 9.12 Response to a sinusoidal force; 9.13 Moving foundation; 9.14 Rotating out-of-balance masses; 9.15 Transmissibility; 9.16 Resonance
9.17 Estimation of damping from the width of the peak

Sommario/riassunto

Students of engineering mechanics require a treatment embracing principles, practice an problem solving. Each are covered in this text in a way which students will find particularly helpful. Every chapter gives a thorough description of the basic theory, and a large selection of worked examples are explained in an understandable, tutorial style. Graded problems for solution, with answers, are also provided. Integrating statistics and dynamics within a single volume, the book will support the study of engineering mechanics throughout an undergraduate course. The theory of two- and three-