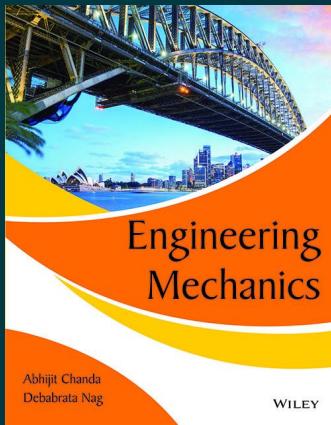




Engineering Mechanics

By Abhijit Chanda, Debabrata Nag

Paperback

9788126570935

₹1,499.00

Pages: 520

Description

Engineering Mechanics provides a comprehensive coverage for the Mechanical Engineering students and Practicing Engineers. With the purpose of providing a smooth transition from high school mathematics to Engineering Mechanics, a separate dedicated chapter on Vector Algebra has been introduced at the beginning of this book. The subject matter has been presented with essential and coherent theoretical background. It also highlights the applications of the theory learnt through a wide number of worked-out Solved Examples arranged in increasingly difficult level.

About the Author

Abhijit Chanda, Debabrata Nag

Dr. Abhijit Chanda is currently a Professor of Mechanical Engineering department, Jadavpur University, Kolkata. Dr. Chanda has over 15 years of teaching experience. He co-authored a book on Strength of Materials published by Wiley India. His research interests are in the fields of Material Science, Bio-Materials

Table of Contents

Preface

Statics

Chapter 1 a Quick Glimpse to Vector algebra

1.1 Introduction

1.2 Unit Vector

1.3 Direction Cosines

1.4 Vector as a Line Segment

1.5 Position Vector

1.6 Vector Addition and Subtraction

1.7 Product of Two Vectors

1.8 Vector Equation

1.8.1 Linearly Independent Vectors

1.9 A Look to Different Coordinate Systems

Chapter 2 introduction to Mechanics

2.1 Mechanics – Basic Definitions

2.2 Idealisations and Basic Assumptions

2.3 Dimensions, Law of Dimensional Homogeneity and Units

Chapter 3 Vector Mechanics

3.1 Introduction

3.2 An Introduction to Vector Algebra

3.3 Miscellaneous Vectors

3.4 Vector Resolution and Cartesian Vector

3.5 Position Vector

3.6 Product of Vectors

3.7 Couple-Moment

Chapter 4 Equivalent Force and Moment

4.1 Introduction

4.2 Basic Concept

4.3 Varignon's Theorem of Moment

Chapter 5 Equilibrium

5.1 Introduction

5.2 Analysis Methodology

5.3 Free Body Diagrams

5.4 Two-Force Member

5.5 Three-Force Member

5.6 Frames and Machines

Chapter 6 Truss

6.1 Introduction

6.2 Types of Truss

6.3 Analysis of Truss

Chapter 7 Friction

7.1 Introduction

7.2 Governing Equation of Friction

7.3 Steps of Analysis

7.4 Friction in Simple Machines

Chapter 8 Central Points and Properties of Surfaces

8.1 Introduction

8.2 Centre of Mass and Centre of Gravity

8.3 Area Moment of Inertia

8.4 Product Area-Moment of Inertia

8.5 Parallel Axis Theorem

8.6 Perpendicular Axis Theorem

8.7 Area Moment of Inertia for Composite Area

8.8 Centroid of Shell Element

Chapter 9 Distributed Force Systems

9.1 Introduction

9.2 Types of Distributed Load

9.3 Analysis of Plane Distributed Load

Chapter 10 Virtual Work

10.1 Introduction

10.2 Virtual Work Theorems and Equation of Equilibrium Formulations

Dynamics

Chapter 1 Particle Kinematics

Objectives

1.1 Introduction

1.2 Study of Kinematics

1.3 Rectilinear Motion

1.4 Plane Curvilinear Motion in X-Y Coordinates

1.5 n-t Coordinates for Curvilinear Motion

1.6 Curvilinear Motion in Polar Coordinates

1.7 Kinematics of Connected Bodies

Chapter 2 Kinetics

2.1 Introduction

2.2 Kinetics of a Particle

2.3 Two-Dimensional Kinetics of a Slab-Like Rigid Body

2.4 D'Alembert's Principle

2.5 Types of Kinetics Problems

Chapter 3 Work, Energy and Power

3.1 Introduction

3.2 Work Done by Various Types of Forces

3.3 Energy

3.4 Conservative Forces

3.5 Work-Energy Principle

3.6 Power

Chapter 4 Momentum and Impulse

4.1 Impulse and Linear Momentum of a Particle

4.2 Angular Momentum

4.3 Conservation of Linear Momentum

4.4 Conservation of Angular Momentum

4.5 Linear Momentum for a System of Mass Particles

4.6 Impulsive Forces and Moments

4.7 Collision of Bodies

Chapter 5 Dynamics of System of Particles

5.1 Introduction

5.2 Kinematics of System

5.3 Kinetics of the System

Chapter 6 Plane Kinematics of Rigid Body

6.1 Rigid Body

6.2 Motion of Rigid Body in Two Dimensions

6.3 Instantaneous Centre of Velocity

6.4 Piston Displacement and Velocity of a Reciprocating Mechanism

6.5 Special Discussion on the Locus of a Point on the Connecting Rod

6.6 Rolling Motion of Cylinder-Like Body

Chapter 7 Rotational Kinetics of Rigid Bodies

7.1 Introduction

7.2 Equations of Motion of Body Undergoing Plane Fixed-Axis Rotation

7.3 D'Alembert's Principle

7.4 Mass-Moment of Inertia

Chapter 8 Introduction to Dynamics of Vibration

8.1 Introduction

8.2 Free Vibration of an SDOF System

8.3 Consideration of Mass of the Spring Element

8.4 Damped Free Vibration of Single Degree of Freedom System

8.5 Viscous Damping

8.6 Forced Vibration of Single Degree of Freedom System

8.7 Forced Vibration

Solved Examples

Practice Problems

Index

To purchase this product, please visit:

<https://www.wileyindia.com/engineering-mechanics.html>



Scan to buy