

INSTRUCTOR SOLUTIONS MANUAL

SEARS & ZEMANSKY'S

COLLEGE PHYSICS

9TH EDITION

HUGH D. YOUNG

Forrest Newman

Sacramento City College

PEARSON

Boston Columbus Indianapolis New York San Francisco Upper Saddle River
Amsterdam Cape Town Dubai London Madrid Milan Munich Paris Montreal Toronto
Delhi Mexico City São Paulo Sydney Hong Kong Seoul Singapore Taipei Tokyo

Executive Editor:
Senior Project Editor:
Editorial Manager:
Managing Editor:
Production Project Manager:
Production Management and Compositor:
Senior Marketing Manager:

Nancy Whilton
Katie Conley
Laura Kenney
Corinne Benson
Beth Collins
PreMediaGlobal
Kerry Chapman



Copyright © 2012, 2007 Pearson Education, Inc., publishing as Addison-Wesley, 1301 Sansome Street, San Francisco, CA 94111. All rights reserved. Manufactured in the United States of America. This publication is protected by Copyright and permission should be obtained from the publisher prior to any prohibited reproduction, storage in a retrieval system, or transmission in any form or by any means, electronic, mechanical, photocopying, recording, or likewise. To obtain permission(s) to use material from this work, please submit a written request to Pearson Education, Inc., Permissions Department, 1900 E. Lake Ave., Glenview, IL 60025. For information regarding permissions, call (847) 486-2635.

Many of the designations used by manufacturers and sellers to distinguish their products are claimed as trademarks. Where those designations appear in this book, and the publisher was aware of a trademark claim, the designations have been printed in initial caps or all caps.

PEARSON

ISBN 10: 0-321-69665-4
ISBN 13: 978-0-321-69665-6

CONTENTS

Preface.....	v
Chapter 0 Mathematics Review	0-1
Mechanics	
Chapter 1 Models, Measurements, and Vectors	1-1
Chapter 2 Motion along a Straight Line	2-1
Chapter 3 Motion in a Plane	3-1
Chapter 4 Newton's Laws of Motion	4-1
Chapter 5 Applications of Newton's Laws	5-1
Chapter 6 Circular Motion and Gravitation	6-1
Chapter 7 Work and Energy	7-1
Chapter 8 Momentum	8-1
Chapter 9 Rotational Motion	9-1
Chapter 10 Dynamics of Rotational Motion	10-1
Periodic Motion, Waves, and Fluids	
Chapter 11 Elasticity and Periodic Motion	11-1
Chapter 12 Mechanical Waves and Sound	12-1
Chapter 13 Fluid Mechanics	13-1
Thermodynamics	
Chapter 14 Temperature and Heat	14-1
Chapter 15 Thermal Properties of Matter	15-1
Chapter 16 The Second Law of Thermodynamics	16-1

Electricity and Magnetism

Chapter 17	Electric Charge and Electric Field	17-1
Chapter 18	Electric Potential and Capacitance.....	18-1
Chapter 19	Current, Resistance, and Direct-Current Circuits	19-1
Chapter 20	Magnetic Field and Magnetic Forces.....	20-1

Magnetic Forces

Chapter 21	Electromagnetic Induction	21-1
Chapter 22	Alternating Current	22-1
Chapter 23	Electromagnetic Waves	23-1

Light and Optics

Chapter 24	Geometric Optics	24-1
Chapter 25	Optical Instruments	25-1
Chapter 26	Interference and Diffraction.....	26-1

Modern Physics

Chapter 27	Relativity	27-1
Chapter 28	Photons, Electrons, and Atoms	28-1
Chapter 29	Atoms, Molecules, and Solids	29-1
Chapter 30	Nuclear and High-Energy Physics	30-1

PREFACE

This Instructor Solutions Manual contains detailed solutions to all end-of-chapter problems. Solutions are done in the Set Up/Solve/Reflect framework used in the textbook. In most cases rounding was done in intermediate steps, so you may obtain slightly different results if you handle the rounding differently. We have made every effort to be accurate and correct in the solutions, but if you find errors or ambiguities it would be very helpful if you would point these out to the publisher.

