

Introductory Physical Geology

Laboratory Manual



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Figures 2.5, 2.10, 2.11, 2.14, 2.15, 3.7, 4.8, 5.2, 5.3, 8.2, 8.3, 9.4, 9.10, 10.5A, 11.3, 11.4, 11.5A, 11.6, 11.7, 11.8, 11.9, 11.10, 11.12, 12.2, 12.8, 12.11, 13.1, 13.2A, 13.4, 13.5, 13.15, 13.16B, and 13.19 A & B from *Physical Geology Across the American Landscape*, 3d edition, by John J. Renton. Copyright © 2011 by the Coast Community College District and Kendall Hunt Publishing Company.

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Revised Printing: 2015

Published by Kendall Hunt Publishing Company.

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Lab Manual Only: ISBN-13: 978-1-4652-6998-0

Complete Lab Kit (lab manual and box of rocks): ISBN-13: 978-1-4652-7000-9

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Printed in the United States of America

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Acknowledgments

Several of the individuals responsible for the creation of this course are listed on the copyright page of this book. In addition to these people, appreciation is expressed for the contributions of the following individuals:

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Sylvia E. Amito’elau, M.S., has overseen the instructional design of this lab manual, as well its accompanying textbook and online course, from concept to completion. She is an instructional designer for Coast Learning Systems, a division of Coastline Community College in Fountain Valley, California. She has assisted in design and development on several educational projects, including online courses in accounting, Arabic, chemistry, Chinese, education, math, and student success for more than 8 years. At Coastline Community College, Sylvia is responsible for providing instructional design, training, and support for all faculty, particularly in areas related to distance learning. As a member of the Senate Academic Standards Committee, she participated in the development of the Coastline Academic Quality Rubric. She is also a part-time faculty member teaching computer application courses and has experience teaching courses in various delivery modalities such as classroom, hybrid, and online. In addition, Sylvia has worked on the California Virtual Campus project, training and assisting Southern California community college faculty in the design, development, and delivery of online instruction. Sylvia holds a Master of Science degree in Instructional Technology and a Bachelor of Arts degree in Mathematics.

We would like to express our thanks to the members of the Academic Advisory Team whose names appear below. In particular, we would like to express special thanks to Debbie Secord, M.S and Jay Yett, M.S for their dedication to this manual.

Special thanks are also owed to the graphic design contributions made by Bob Dixon, Marie Hulett, Don Vierstra, and Mark Worden.

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Preface: How to Take This Lab Course

To the Student

Welcome to the *Introductory Physical Geology Laboratory Manual*. The first lab lesson in this manual deals with how to read and use topographic maps. The remaining lessons follow a sequence that progresses through the basics of plate tectonics, seismology, minerals and rocks, and geologic time and concludes with such overarching topics as Earth's major geologic features and economic geology resources.

Learning Outcomes

The academic advisors, instructional designers, and producers of this lab manual have specified the following learning outcomes for students. After successfully completing all of the lab exercises, you should be able to:

1. Effectively apply the concepts, principles, and theories of geology to make accurate observations and to identify and distinguish among samples/structures/landscapes.
2. Gather and analyze data, formulate and test hypotheses, solve problems, and come to supportable conclusions given various scenarios and research topics.

Features

This intensive laboratory course explores the basic concepts and principles of physical geology. Each lesson includes specific learning objectives that students should use to prepare for the lab. The lab manual includes exercises and procedures that illuminate the central principles of physical geology. Each lab lesson includes questions designed to help you analyze, review, and apply your knowledge of the material covered in the lab course. The complete course of study for this introductory geology lab includes reading this lab manual, watching the video clips and completing the activities in the online component, and completing the lab exercises in the manual.

The laboratory kit contains most of the materials and mineral samples necessary to conduct the lab exercises contained in each lesson.

Each lesson in the lab manual contains the following elements:

➔ **Overview**

This section introduces the topics covered in the lab exercises, explains why they are important, and makes connections to previous lesson concepts that you'll need to remember.

➔ **Learning Objectives**

These objectives outline the significant goals to be achieved after completing each lesson. (Note: Instructors often design test questions after learning objectives, so use them to help focus your study.)

➔ **Materials**

This section provides a list of materials that will be needed to complete the lab exercises. Some items will be provided in the accompanying lab kit, and others may need to be purchased or borrowed if they are not readily available in your home.

➔ **Illustrations**

These drawings and photographs have been included to amplify your understanding of specific concepts or to illustrate particular steps and procedures within the course of various lab experiments.

➔ **Online Activities**

In this section, you will participate in a variety of interactive games and simulations, watch videos, view images, and complete quizzes based on these activities.

➔ **Quiz**

This section includes a variety of questions designed to verify your comprehension of the lab exercises and will help you make connections to and apply the principles covered within the course.

How to Navigate This Lab

This lab manual has been designed to be used as a tool to help reinforce topics and concepts on which you will later be tested. To complete this lab course successfully, you will need to complete exercises that:

- provide you with information that you can apply to your everyday experiences.
- provide visual reinforcement to help you understand and appreciate the complexity of the various physical geologic processes that occur above and beneath the surface of the earth as you know it.
- provide you with the opportunity to practice what you have learned.
- help make the study of physical geology more organized, systematic, and enjoyable. Since you are required to assimilate a large amount of information in a short period of time, a lot of your dedicated time is required. You should be prepared to set aside time when you can tackle and complete an entire lab exercise so that you can master the concepts involved and be prepared for assessment.

It is important that you schedule enough time to read, study, review, and reflect. Also, take some time immediately after completing each lab lesson to reflect on what you have just learned. This is an excellent time to discuss the lesson with a classmate, friend, or family member. Your active thinking and involvement will promote your success.

