

Preface

Whether you have already purchased this book or are still contemplating buying it, we hope you will take some time reading this preface so that you can understand why this book was written and how to get the most out of it.

The Purpose of this Book

The authors have spent many years supporting students with the mathematical demands of undergraduate and postgraduate courses in the biosciences. We believe that you will benefit from our experience and the immense effort that we have poured into this book so that you become successful in both your degree course and future career.

Content

This book consists of twelve chapters and each chapter is divided into two sections. It is designed to allow you progress in a logical manner from sets of easier, fundamental problems to much more demanding and complex calculations aligned to various disciplines in biology.

In the first five chapters we cover the essential ground rules to enable a smooth transition into the later chapters. We begin with the arithmetic operations in mathematics in Chapter 1, giving emphasis to the use of equations and indices. In Chapter 2 we move on to fractions and here you will also learn about the rounding of numbers and scientific notation. Chapter 3 introduces the SI units of measurement and rules for their use and conversions between

different units. Ratios and percentages are discussed in Chapter 4, providing examples of calculations encountered when preparing mixtures and solutions with a given percentage concentration. Chapter 5 is dedicated to logarithms, giving clear explanations of the laws of logarithms and the application of logarithms in the biosciences.

In Chapter 6 you will learn about preparing molar solutions and both standard and serial dilutions. We know this is a problem area for many students, hence our decision to devote a whole chapter to these topics.

Chapters 7-10 present calculations relevant to the specialisms in biosciences. Each chapter provides a brief overview of some of the theoretical concepts of each topic before working through typical calculations. Chapter 7 covers measurements made in microscopy, cell biology and microbiology as well as calculations of selected physiological and pharmacological parameters. Chapter 8 focuses on calculations relating to a range of techniques used in analytical biology and radiobiology. Chapter 9 contains examples of solutions to problems in DNA and protein analysis, whilst Chapter 10 is devoted to enzyme kinetics, including analysis of enzyme inhibition.

In Chapter 11 you are introduced to statistics and will conduct some statistical analysis. Chapter 12 demonstrates how to present data correctly in graphs and charts as well as explore relationships between variables using correlation and regression analysis.

Key Features

- **Learning Outcomes**

A summary is provided at the start of each chapter of the learning outcomes expected to be achieved once the chapter has been completed. This will help you keep track of what you have learnt.

- **Worked Examples**

Throughout the book there are numerous worked examples with detailed solutions and explanations, taking you step by step through each calculation.

- **SELF-ASSESSMENT**

There are also calculations for you to attempt independently, then check against the answer key at the end of the book. This will help you check your understanding and increase confidence as problems become progressively more difficult.

- **MyMathLabGlobal**

This book is available with access to the online resource, MyMathLabGlobal, but requires that a course ID has been set up by your tutor for you to use it. This e-resource provides an extensive bank of exercises developed by the authors to provide the opportunity for further

self-assessment (examples of these questions are listed at the end of each half chapter of the book). MyMathLabGlobal will guide you through each step in solving a problem until the fully worked correct answer is displayed. Your tutor has the option to set up homework, quizzes and tests.

- **Key Terms**

Key terms are defined in each chapter and these are highlighted in coloured text where they are explained. A list of key terms is also given at the end of the chapter, indicating those which may appear as a key term in other chapters of the book. Reviewing the key terms once a chapter is completed will ensure you fully understand each concept and are ready to progress further.

In the event that Pearson invite us to produce a second edition, we would like to hear your suggestions on any improvements or additional material that could be included. We can be contacted at: mathsforbiosciences@gmail.com.

Thank you for purchasing this book, we hope you will enjoy using it.

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