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C927HX - LOGAN BLEVINS

Includes endnotes, answers to exercises, and an appendix dataset.

This primer helps students brush up on the quantitative skills they need to succeed in biology. Presented in brief, accessible units, the book covers topics such as working with powers, logarithms, using and understanding graphs, calculating standard deviation, preparing a dilution series, choosing the right statistical test, analyzing enzyme kinetics, and many more.

Experimental Design for the Life Sciences explains how to organise experiments and collect data to make analysis easier, and conclusions more robust. An approachable and articulate style conveys even the most challenging concepts in clear and practical terms, showing how experimental design is about clear thinking and biological understanding, not mathematical or statistical complexity.

Practical Statistics for the Biological Sciences is a handbook of statistical methods for use by workers in the biological sciences at all levels from undergraduate to post-doctoral researcher. The book presents, in a clear and compact form, the most common statistical tests used in the biosciences. It provides a series of flow charts to help in selecting the appropriate test. Each test is described concisely and illustrated by worked examples. The text is accompanied by a CD-ROM containing both Windows and Apple Macintosh versions of PractiStat, a new programme for statistical analysis. PractiStat can be used both as a teaching aid to work through the examples provided and as a valuable, easy to use tool for analysis of the users' own data. The programme provides a simple, intuitive interface and permits the application of the common statistical tests and procedures used by bioscientists.

This textbook introduces a science philosophy called "information theoretic" based on Kullback-Leibler information theory. It focuses on a science philosophy based on "multiple working hypotheses" and statistical models to represent them. The text is written for people new to the information-theoretic approaches to statistical inference, whether graduate students, post-docs, or professionals. Readers are however expected to have a background in general statistical principles, regression analysis, and some exposure to likelihood methods. This is not an elementary text as it assumes reasonable competence in modeling and parameter estimation.

This book uses the statistical language R, which is the choice of ecologists worldwide and is rapidly becoming the 'go-to' stats program throughout the life-sciences. Furthermore, by using a single, real-world dataset throughout the book, readers are encouraged to become deeply familiar with an imperfect but realistic set of data.

Providing students with clear and practical advice on how best to organise experiments and collect data so as to make the subsequent analysis easier and their conclusions more robust, this text assumes no specialist knowledge.

Introduction to Statistics for the Life and Biomedical Sciences has been written to be used in conjunction with a set of self-paced learning labs. These labs guide students through learning how to apply statistical ideas and concepts discussed in the text with the R computing language. The text discusses the important ideas used to support an interpretation (such as the notion of a confidence interval), rather than the process of generating such material from data (such as computing a confidence interval for a particular subset of individuals in a study). This allows students whose main focus is understanding statistical concepts to not be distracted by the details of a particular software package. In our

experience, however, we have found that many students enter a research setting after only a single course in statistics. These students benefit from a practical introduction to data analysis that incorporates the use of a statistical computing language. In a classroom setting, we have found it beneficial for students to start working through the labs after having been exposed to the corresponding material in the text, either from self-reading or through an instructor presenting the main ideas. The labs are organized by chapter, and each lab corresponds to a particular section or set of sections in the text. There are traditional exercises at the end of each chapter that do not require the use of computing. In the current posting, Chapters 1 - 5 have end-of-chapter exercises. More complicated methods, such as multiple regression, do not lend themselves to hand calculation and computing is necessary for gaining practical experience with these methods. The lab exercises for these later chapters become an increasingly important part of mastering the material. An essential component of the learning labs are the "Lab Notes" accompanying each chapter. The lab notes are a detailed reference guide to the R functions that appear in the labs, written to be accessible to a first-time user of a computing language. They provide more explanation than available in the R help documentation, with examples specific to what is demonstrated in the labs.

An accessible undergraduate textbook on the essential math concepts used in the life sciences. The life sciences deal with a vast array of problems at different spatial, temporal, and organizational scales. The mathematics necessary to describe, model, and analyze these problems is similarly diverse, incorporating quantitative techniques that are rarely taught in standard undergraduate courses. This textbook provides an accessible introduction to these critical mathematical concepts, linking them to biological ob-

ervation and theory while also presenting the computational tools needed to address problems not readily investigated using mathematics alone. Proven in the classroom and requiring only a background in high school math, *Mathematics for the Life Sciences* doesn't just focus on calculus as do most other textbooks on the subject. It covers deterministic methods and those that incorporate uncertainty, problems in discrete and continuous time, probability, graphing and data analysis, matrix modeling, difference equations, differential equations, and much more. The book uses MATLAB throughout, explaining how to use it, write code, and connect models to data in examples chosen from across the life sciences. Provides undergraduate life science students with a succinct overview of major mathematical concepts that are essential for modern biology. Covers all the major quantitative concepts that national reports have identified as the ideal components of an entry-level course for life science students. Provides good background for the MCAT, which now includes data-based and statistical reasoning. Explicitly links data and math modeling. Includes end-of-chapter homework problems, end-of-unit student projects, and select answers to homework problems. Uses MATLAB throughout, and MATLAB m-files with an R supplement are available online. Prepares students to read with comprehension the growing quantitative literature across the life sciences. A solutions manual for professors and an illustration package is available.

Introductory Mathematics for the Life Sciences offers a straightforward introduction to the mathematical principles needed for studies in the life sciences. Starting with the basics of numbers, fractions, ratios, and percentages, the author explains progressively more sophisticated concepts, from algebra, measurement, and scientific notation through the linear, power, exponential, and logarithmic functions to introductory statistics. Worked examples illustrate concepts, applications, and interpretations, and exercises at the end of each chapter help readers apply and practice the skills they develop. Answers to the exercises are posted at the end of the text.

Let this down-to-earth book be your guide to the statistical integrity of your work. Without relying on the detailed and complex mathematical explanations found in many other statistical texts, *Principles of Experimental Design for the Life Sciences* teaches how to design, conduct, and interpret top-notch life science studies. Learn about the planning of biomedical studies, the princi-

ples of statistical design, sample size estimation, common designs in biological experiments, sequential clinical trials, high dimensional designs and process optimization, and the correspondence between objectives, design, and analysis. Each of these important topics is presented in an understandable and non-technical manner, free of statistical jargon and formulas. Written by a biostatistical consultant with 25 years of experience, *Principles of Experimental Design for the Life Sciences* is filled with real-life examples from the author's work that you can quickly and easily apply to your own. These examples illustrate the main concepts of experimental design and cover a broad range of application areas in both clinical and nonclinical research. With this one innovative, helpful book you can improve your understanding of statistics, enhance your confidence in your results, and, at long last, shake off those statistical shackles!

All students and researchers in environmental and biological sciences require statistical methods at some stage of their work. Many have a preconception that statistics are difficult and unpleasant and find that the textbooks available are difficult to understand. *Practical Statistics for Environmental and Biological Scientists* provides a concise, user-friendly, non-technical introduction to statistics. The book covers planning and designing an experiment, how to analyse and present data, and the limitations and assumptions of each statistical method. The text does not refer to a specific computer package but descriptions of how to carry out the tests and interpret the results are based on the approaches used by most of the commonly used packages, e.g. Excel, MINITAB and SPSS. Formulae are kept to a minimum and relevant examples are included throughout the text.

Better experimental design and statistical analysis make for more robust science. A thorough understanding of modern statistical methods can mean the difference between discovering and missing crucial results and conclusions in your research, and can shape the course of your entire research career. With *Applied Statistics*, Barry Glaz and Kathleen M. Yeater have worked with a team of expert authors to create a comprehensive text for graduate students and practicing scientists in the agricultural, biological, and environmental sciences. The contributors cover fundamental concepts and methodologies of experimental design and analysis, and also delve into advanced statistical topics, all explored by analyzing real agronomic data with practical and crea-

tive approaches using available software tools. *IN PRESS!* This book is being published according to the "Just Published" model, with more chapters to be published online as they are completed. The second edition of *Statistics for Social Sciences* prepares students from a wide range of disciplines to interpret and learn the statistical methods critical to their field of study. By using the General Linear Model (GLM), the author builds a foundation that enables students to see how statistical methods are interrelated enabling them to build on the basic skills. The author makes statistics relevant to students' varying majors by using fascinating real-life examples from the social sciences. Students who use this edition will benefit from clear explanations, warnings against common erroneous beliefs about statistics, and the latest developments in the philosophy, reporting, and practice of statistics in the social sciences. The textbook is packed with helpful pedagogical features including learning goals, guided practice, and reflection questions.

A straightforward introduction to a wide range of statistical methods for field biologists, using thoroughly explained R code.

The book includes articles from eminent international scientists discussing a wide spectrum of topics of current importance in mathematics and statistics and their applications. It presents state-of-the-art material along with a clear and detailed review of the relevant topics and issues concerned. The topics discussed include message transmission, colouring problem, control of stochastic structures and information dynamics, image denoising, life testing and reliability, survival and frailty models, analysis of drought periods, prediction of genomic profiles, competing risks, environmental applications and chronic disease control. It is a valuable resource for researchers and practitioners in the relevant areas of mathematics and statistics.

Statistics for the Life Sciences, Fourth Edition, covers the key concepts of statistics as applied to the life sciences, while incorporating the tools and themes of modern data analysis. This text uses an abundance of real data in the exercises and examples, and minimizes computation, so that readers can focus on the statistical concepts and issues, not the mathematics. Basic algebra is assumed as a prerequisite.

A Hands-On Approach to Teaching Introductory Statistics Expanded with over 100 more pages, *Introduction to Statistical Data Analysis for the Life Sciences, Second Edition* presents the right bal-

ance of data examples, statistical theory, and computing to teach introductory statistics to students in the life sciences. This popular textbook covers the mathematics underlying classical statistical analysis, the modeling aspects of statistical analysis and the biological interpretation of results, and the application of statistical software in analyzing real-world problems and datasets. New to the Second Edition A new chapter on non-linear regression models A new chapter that contains examples of complete data analyses, illustrating how a full-fledged statistical analysis is undertaken Additional exercises in most chapters A summary of statistical formulas related to the specific designs used to teach the statistical concepts This text provides a computational toolbox that enables students to analyze real datasets and gain the confidence and skills to undertake more sophisticated analyses. Although accessible with any statistical software, the text encourages a reliance on R. For those new to R, an introduction to the software is available in an appendix. The book also includes end-of-chapter exercises as well as an entire chapter of case exercises that help students apply their knowledge to larger datasets and learn more about approaches specific to the life sciences.

This open access textbook provides the background needed to correctly use, interpret and understand statistics and statistical data in diverse settings. Part I makes key concepts in statistics readily clear. Parts I and II give an overview of the most common tests (t-test, ANOVA, correlations) and work out their statistical principles. Part III provides insight into meta-statistics (statistics of statistics) and demonstrates why experiments often do not replicate. Finally, the textbook shows how complex statistics can be avoided by using clever experimental design. Both non-scientists and students in Biology, Biomedicine and Engineering will benefit from the book by learning the statistical basis of scientific claims and by discovering ways to evaluate the quality of scientific reports in academic journals and news outlets.

"This book is designed for life and medical science students and professionals who need a basic knowledge of mathematics and statistics." --pref.

This book covers several of the statistical concepts and data analytic skills needed to succeed in data-driven life science research. The authors proceed from relatively basic concepts related to computed p-values to advanced topics related to analyzing high-throughput data. They include the R code that performs this analy-

sis and connect the lines of code to the statistical and mathematical concepts explained.

Provides well-organized coverage of statistical analysis and applications in biology, kinesiology, and physical anthropology with comprehensive insights into the techniques and interpretations of R, SPSS®, Excel®, and Numbers® output An Introduction to Statistical Analysis in Research: With Applications in the Biological and Life Sciences develops a conceptual foundation in statistical analysis while providing readers with opportunities to practice these skills via research-based data sets in biology, kinesiology, and physical anthropology. Readers are provided with a detailed introduction and orientation to statistical analysis as well as practical examples to ensure a thorough understanding of the concepts and methodology. In addition, the book addresses not just the statistical concepts researchers should be familiar with, but also demonstrates their relevance to real-world research questions and how to perform them using easily available software packages including R, SPSS®, Excel®, and Numbers®. Specific emphasis is on the practical application of statistics in the biological and life sciences, while enhancing reader skills in identifying the research questions and testable hypotheses, determining the appropriate experimental methodology and statistical analyses, processing data, and reporting the research outcomes. In addition, this book:

- Aims to develop readers' skills including how to report research outcomes, determine the appropriate experimental methodology and statistical analysis, and identify the needed research questions and testable hypotheses
- Includes pedagogical elements throughout that enhance the overall learning experience including case studies and tutorials, all in an effort to gain full comprehension of designing an experiment, considering biases and uncontrolled variables, analyzing data, and applying the appropriate statistical application with valid justification
- Fills the gap between theoretically driven, mathematically heavy texts and introductory, step-by-step type books while preparing readers with the programming skills needed to carry out basic statistical tests, build support figures, and interpret the results
- Provides a companion website that features related R, SPSS, Excel, and Numbers data sets, sample PowerPoint® lecture slides, end of the chapter review questions, software video tutorials that highlight basic statistical concepts, and a student workbook and instructor manual

An Introduction to Statistical Analysis in Research: With Applications in

the Biological and Life Sciences is an ideal textbook for upper-undergraduate and graduate-level courses in research methods, biostatistics, statistics, biology, kinesiology, sports science and medicine, health and physical education, medicine, and nutrition. The book is also appropriate as a reference for researchers and professionals in the fields of anthropology, sports research, sports science, and physical education. KATHLEEN F. WEAVER, PhD, is Associate Dean of Learning, Innovation, and Teaching and Professor in the Department of Biology at the University of La Verne. The author of numerous journal articles, she received her PhD in Ecology and Evolutionary Biology from the University of Colorado. VANESSA C. MORALES, BS, is Assistant Director of the Academic Success Center at the University of La Verne. SARAH L. DUNN, PhD, is Associate Professor in the Department of Kinesiology at the University of La Verne and is Director of Research and Sponsored Programs. She has authored numerous journal articles and received her PhD in Health and Exercise Science from the University of New South Wales. KANYA GODDE, PhD, is Assistant Professor in the Department of Anthropology and is Director/Chair of Institutional Review Board at the University of La Verne. The author of numerous journal articles and a member of the American Statistical Association, she received her PhD in Anthropology from the University of Tennessee. PABLO F. WEAVER, PhD, is Instructor in the Department of Biology at the University of La Verne. The author of numerous journal articles, he received his PhD in Ecology and Evolutionary Biology from the University of Colorado.

This book contains a rich set of tools for nonparametric analyses, and the purpose of this text is to provide guidance to students and professional researchers on how R is used for nonparametric data analysis in the biological sciences: To introduce when nonparametric approaches to data analysis are appropriate To introduce the leading nonparametric tests commonly used in biostatistics and how R is used to generate appropriate statistics for each test To introduce common figures typically associated with nonparametric data analysis and how R is used to generate appropriate figures in support of each data set The book focuses on how R is used to distinguish between data that could be classified as nonparametric as opposed to data that could be classified as parametric, with both approaches to data classification covered extensively. Following an introductory lesson on nonparametric statistics for the biological sciences, the book is organized into eight self-

contained lessons on various analyses and tests using R to broadly compare differences between data sets and statistical approach.

Uses practical examples to teach laboratory scientists and research clinicians how to accomplish statistical tasks confidently.

This monograph will provide an in-depth mathematical treatment of modern multiple test procedures controlling the false discovery rate (FDR) and related error measures, particularly addressing applications to fields such as genetics, proteomics, neuroscience and general biology. The book will also include a detailed description how to implement these methods in practice. Moreover new developments focusing on non-standard assumptions are also included, especially multiple tests for discrete data. The book primarily addresses researchers and practitioners but will also be beneficial for graduate students.

Written primarily for mid-to-upper level undergraduates, this compelling introduction to power analysis offers a clear, conceptual understanding of the factors that influence statistical power, as well as guidance on improving and presenting the outcomes of power analyses to justify experimental design decisions.

For undergraduate courses in corporate finance and financial management. Develop and begin to apply financial principles People often struggle to see how financial concepts relate to their personal lives and prospective careers. Financial Management: Principles and Applications gives readers a big picture perspective of finance and how it is important in their personal and professional lives. Utilizing five key principles, the 13th Edition provides an approachable introduction to financial decision-making, weaving in real world issues to demonstrate the practical applications of critical financial concepts. Also available with MyFinanceLab(tm) MyFinanceLab is an online homework, tutorial, and assessment program designed to work with this text to engage students and improve results. Within its structured environment, students practice what they learn, test their understanding, and pursue a personalized study plan that helps them better absorb course material and understand difficult concepts. Note: You are purchasing a standalone product; MyLab(tm)& Mastering(tm) does not come packaged with this content. Students, if interested in purchasing this title with MyLab & Mastering, ask your instructor for the correct package ISBN and Course ID. Instructors, contact your Pearson representative for more information. If you would like to

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This remarkably engaging textbook gives biology students an introduction to statistical practice all their own. It covers essential statistical topics with examples and exercises drawn from across the life sciences, including the fields of nursing, public health, and allied health. Based on David Moore's The Basic Practice of Statistics, PSLS mirrors that #1 bestseller's signature emphasis on statistical thinking, real data, and what statisticians actually do. The new edition includes new and updated exercises, examples, and samples of real data, as well as an expanded range of media tools for students and instructors.

This textbook provides an introduction to the free software Python and its use for statistical data analysis. It covers common statistical tests for continuous, discrete and categorical data, as well as linear regression analysis and topics from survival analysis and Bayesian statistics. Working code and data for Python solutions for each test, together with easy-to-follow Python examples, can be reproduced by the reader and reinforce their immediate understanding of the topic. With recent advances in the Python ecosystem, Python has become a popular language for scientific computing, offering a powerful environment for statistical data analysis and an interesting alternative to R. The book is intended for master and PhD students, mainly from the life and medical sciences, with a basic knowledge of statistics. As it also provides some statistics background, the book can be used by anyone who wants to perform a statistical data analysis.

This book offers readers an accessible introduction to the world of multivariate statistics in the life sciences, providing a comprehensive description of the general data analysis paradigm, from exploratory analysis (principal component analysis, self-organizing maps and clustering) to modeling (classification, regression) and validation (including variable selection). It also includes a special section discussing several more specific topics in the area of chemometrics, such as outlier detection, and biomarker identifica-

tion. The corresponding R code is provided for all the examples in the book; and scripts, functions and data are available in a separate R package. This second revised edition features not only updates on many of the topics covered, but also several sections of new material (e.g., on handling missing values in PCA, multivariate process monitoring and batch correction).

Appropriate for all courses in statistical methods for the agricultural, life, health, and environmental sciences, this book offers a practical and modern approach that minimizes computation and emphasizes conceptual understanding. Rao continually emphasizes issues and topics most relevant to modern day research in the life sciences. For example, point and interval estimation take priority over testing of statistical hypothesis and methods and guidelines for determination of sample size are indicated whenever possible. Statistical Research Methods in the Life Sciences also presents a self-contained and complete discussion of each experimental situation considered. In the two-sample setting, for example, in addition to presenting the procedures under the usual analysis of variance assumption, Rao also presents methods for checking the validity of the assumptions.

The 5th Edition of Statistics for the Life Sciences uses authentic examples and exercises from a wide variety of life science domains to give statistical concepts personal relevance, enabling students to connect concepts with situations they will encounter outside the classroom. The emphasis on understanding ideas rather than memorising formulas makes the text ideal for students studying a variety of scientific fields: animal science, agronomy, biology, forestry, health, medicine, nutrition, pharmacy, physical education, zoology and more. In the 5th Edition, randomisation tests have been moved to the fore to motivate the inference procedures introduced in the text. There are no prerequisites for the text except elementary algebra. The full text downloaded to your computer With eBooks you can: search for key concepts, words and phrases make highlights and notes as you study share your notes with friends eBooks are downloaded to your computer and accessible either offline through the Bookshelf (available as a free download), available online and also via the iPad and Android apps. Upon purchase, you'll gain instant access to this eBook. Time limit The eBooks products do not have an expiry date. You will continue to access your digital ebook products whilst you have your Bookshelf installed. For introductory un-

dergraduate or graduate courses in statistics aimed at life science majors.

Diffusion processes are a promising instrument for realistically modelling the time-continuous evolution of phenomena not only in the natural sciences but also in finance and economics. Their mathematical theory, however, is challenging, and hence diffusion modelling is often carried out incorrectly, and the according statistical inference is considered almost exclusively by theoreticians. This book explains both topics in an illustrative way which also addresses practitioners. It provides a complete overview of the current state of research and presents important, novel insights. The theory is demonstrated using real data applications.

Statistical methods are a key tool for all scientists working with data, but learning the basic mathematical skills can be one of the most challenging components of a biologist's training. This accessible book provides a contemporary introduction to the classical techniques and modern extensions of linear model analysis: one of the most useful approaches in the analysis of scientific data in the life and environmental sciences. It emphasizes an estimation-based approach that accounts for recent criticisms of the over-use of probability values, and introduces alternative approaches using information criteria. Statistics are introduced

through worked analyses performed in R, the free open source programming language for statistics and graphics, which is rapidly becoming the standard software in many areas of science and technology. These analyses use real data sets from ecology, evolutionary biology and environmental science, and the data sets and R scripts are available as support material. The book's structure and user friendly style stem from the author's 20 years of experience teaching statistics to life and environmental scientists at both the undergraduate and graduate levels. The New Statistics with R is suitable for senior undergraduate and graduate students, professional researchers, and practitioners in the fields of ecology, evolution, environmental studies, and computational biology.

This textbook teaches crucial statistical methods to answer research questions using a unique range of statistical software programs, including MINITAB and R. This textbook is developed for undergraduate students in agriculture, nursing, biology and biomedical research. Graduate students will also find it to be a useful way to refresh their statistics skills and to reference software options. The unique combination of examples is approached using MINITAB and R for their individual strengths. Subjects covered include among others data description, probability distributions, experimental design, regression analysis, randomized de-

sign and biological assay. Unlike other biostatistics textbooks, this text also includes outliers, influential observations in regression and an introduction to survival analysis. Material is taken from the author's extensive teaching and research in Africa, USA and the UK. Sample problems, references and electronic supplementary material accompany each chapter.

An understanding of statistics and experimental design is essential for life science studies, but many students lack a mathematical background and some even dread taking an introductory statistics course. Using a refreshingly clear and encouraging reader-friendly approach, this book helps students understand how to choose, carry out, interpret and report the results of complex statistical analyses, critically evaluate the design of experiments and proceed to more advanced material. Taking a straightforward conceptual approach, it is specifically designed to foster understanding, demystify difficult concepts and encourage the unsure. Even complex topics are explained clearly, using a pictorial approach with a minimum of formulae and terminology. Examples of tests included throughout are kept simple by using small data sets. In addition, end-of-chapter exercises, new to this edition, allow self-testing. Handy diagnostic tables help students choose the right test for their work and remain a useful refresher tool for postgraduates.