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Crossover is a laboratory manual and computer program that work together to teach the principles of genetics.

Designed to complement regular textbooks and classroom instruction,

Crossover consists of thirty-five modules that can be tailored to fit genetics courses at several levels.

Examples, interactive computer models, problems, and self-tests all help students understand difficult concepts and learn the basic mathematical skills needed to study contemporary theories of genetics, evolution, and breeding. The easy-to-use tutorial system lets students work at

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their own pace. Features include: * In-depth investigations of meiosis, genetic ratios, linkage mutation, natural selection, Hardy-Weinberg equilibrium, artificial selection, quantitative genetics, breeding methods, mating designs, plant patent law, and the use of molecular markers * A computer model that allows students to manipulate genetic parameters and compare outcomes. Students can observe evolution and artificial selection in action * A "Major Concepts" section at the beginning of each chapter to help students focus on the important material to be learned * A visual, easy-to-understand presentation of material * Exercises based on genetic data and analyses from actual research projects * Several stages of complexity within each area of instruction. * Instant grading of exercises * "Suggested Readings" at the

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end of each chapter to direct the student to related books, articles, and computer programs.

This text book, originally published in 1970, presents the field of population genetics, starting with elementary concepts and leading the reader well into the field. It is concerned mainly with population genetics in a strict sense and deals primarily with natural populations and less fully with the rather similar problems that arise in breeding live stock and cul t i vat ed plans . The emphasis is on the behavior of genes and population attributes under natural selection where the most important measure is Darwinian fitness. This text is intended for graduate students and advanced undergraduates in genetics and population biology. This book steers a middle course between completely

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verbal biological arguments and the rigor of the mathematician. The first two-thirds of the book do not require advanced mathematical background. An ordinary knowledge of calculus will suffice. The latter parts of the book, which deal with population stochastically, use more advanced methods.

Eighth Edition

**Environmental Toxicology and
Chemistry**

Lecture Notes in Population Genetics

Fish Bulletin

Crossover

**Guide for the Care and Use of
Laboratory Animals**

The second edition of The Diversity of Fishes represents a major revision of the world ' s most widely adopted

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Ichthyology textbook. Expanded and updated, the second edition is illustrated throughout with striking color photographs depicting the spectacular evolutionary adaptations of the most ecologically and taxonomically diverse vertebrate group. The text incorporates the latest advances in the biology of fishes, covering taxonomy, anatomy, physiology, biogeography, ecology, and behavior. A new chapter on genetics and molecular ecology of fishes has been added, and conservation is emphasized throughout. Hundreds of new and redrawn illustrations augment readable

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text, and every chapter has been revised to reflect the discoveries and greater understanding achieved during the past decade. Written by a team of internationally-recognized authorities, the first edition of *The Diversity of Fishes* was received with enthusiasm and praise, and incorporated into ichthyology and fish biology classes around the globe, at both undergraduate and postgraduate levels. The second edition is a substantial update of an already classic reference and text. Companion resources site This book is accompanied by a resources site: www.wiley.com/go/helfman

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The site is being constantly updated by the author team and provides:

- Related videos selected by the authors
- Updates to the book since publication
- Instructor resources
- A chance to send in feedback

This volume outlines the major findings from the Norwegian research programme on whales and seals in Norwegian waters. A wide range of topics are covered, including physiological aspects, social organization, population dynamics, stock assessment and management. The book will be of great value to scientists and managers, as well as to members of the

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general public interested in
environmental issues.

Fish Genetics Research in
Member Countries and
Institutions of the International
Network on Genetics in
Aquaculture

Concepts and Applications in
Genetics, Evolution, and
Breeding : an Interactive
Computer-based Laboratory
Manual

A Biologist's Guide to
Mathematical Modeling in
Ecology and Evolution

Biology of Polar Fish
Genetics of Subpolar Fish and
Invertebrates

May 17-19, 1993, Juneau,
Alaska, USA : Eleventh Lowell

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Wakefield Fisheries Symposium

Thirty years ago, biologists could get by with a rudimentary grasp of mathematics and modeling. Not so today. In seeking to answer fundamental questions about how biological systems function and change over time, the modern biologist is as likely to rely on sophisticated mathematical and computer-based models as traditional fieldwork. In this book, Sarah Otto and Troy Day provide biology students with the tools necessary to both

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interpret models and to build their own. The book starts at an elementary level of mathematical modeling, assuming that the reader has had high school mathematics and first-year calculus. Otto and Day then gradually build in depth and complexity, from classic models in ecology and evolution to more intricate class-structured and probabilistic models. The authors provide primers with instructive exercises to introduce readers to the more advanced subjects of

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linear algebra and probability theory. Through examples, they describe how models have been used to understand such topics as the spread of HIV, chaos, the age structure of a country, speciation, and extinction. Ecologists and evolutionary biologists today need enough mathematical training to be able to assess the power and limits of biological models and to develop theories and models themselves. This innovative book will be an indispensable guide to the

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world of mathematical
models for the next
generation of biologists.
A how-to guide for
developing new
mathematical models in
biology Provides step-by-
step recipes for
constructing and analyzing
models Interesting
biological applications
Explores classical models
in ecology and evolution
Questions at the end of
every chapter Primers
cover important
mathematical topics
Exercises with answers
Appendixes summarize
useful rules Labs and

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advanced material

available

Lecture Notes in

Population Genetics By Kent

E. Holsinger

Assessment of Sublethal

Mercury Stress in a

Contaminated Lake

Selection and Breeding

Programs in Aquaculture

Teaching Evolution in

Secondary Biology

Quantitative Methods in

Aquatic Ecotoxicology

Indo-Pacific Fish Biology

Theory and Applications

This volume is a collection of papers assembled to honor Hiroya Kawanabe, an eminent Japanese ecologist who studied fishes and other organisms.

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Kawanabe retired from his position as Professor at Kyoto University in March 1996. In the first section of the volume his career is highlighted by a biography describing his life and work, a bibliography of his more than 750 lifetime publications, and a personal interview with a colleague who has been close to his work throughout his career. Papers in the second section of the volume include invited reviews of research on fish ecology in Japan, a historical overview of freshwater fishes of Japan, and recent studies on sex change among reef fishes. The 24 papers in the third section of the volume by Japanese fish biologists and their collaborators cover a wide variety of topics on fish biology. These include papers on evolution, genetics, systematics, reproductive biology, early life history, life history variation,

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behavior, physiology, ecology, and zoogeography. These papers address fishes from lentic, lotic, and marine ecosystems in Japan, Asia, Africa, North America, and in some cases worldwide. One of Hiroya Kawanabe's most brilliant and lasting contributions was to foster collaboration between Japanese ecologists and other scientists.

This book provides a quantitative treatment of the science of ecotoxicology. The first chapters consider fundamental concepts and definitions essential to understanding the fate and effects of toxicants at various levels of ecological organization as covered in the remaining chapters. Scientific ecotoxicology and associated topics are defined. The historical perspective, rationale, and characteristics are outlined for the

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strong inferential and quantitative approach advocated in this book. The general measurement process is discussed, and methodologies for defining and controlling variance, which could otherwise exclude valid conclusions regarding ecotoxicological endeavors, are considered.

Ecotoxicological concepts at increasing levels of ecological organization are discussed in the second part of the book. Quantitative methods used to measure toxicant effects are outlined in this section. The final chapter summarizes the book with a brief discussion of ecotoxicological assessment. Numerous figures and tables accompany text, with many statistical tables found in the appendix for quick reference. Although the book primarily focuses on aquatic systems, with appropriate modification the

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concepts and methods can be applied to terrestrial systems.

Proceedings of the International Symposium and Educational Workshop on Fish-Marking Techniques, Held at the University of Washington, Seattle, Washington, USA, June 27-July 1, 1988

New York Fish and Game Journal
Radioactive Waste Management
Adaptation and Natural Selection
Health Physics Division annual progress report

ISE The Living World

Although aquaculture as a biological production system has a long history, systematic and efficient breeding programs to improve economically important traits in the

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farmed species have rarely been utilized until recently, except for salmonid species. This means that the majority of aquaculture production (more than 90 %) is based on genetically unimproved stocks. In farm animals the situation is vastly different: practically no terrestrial farm production is based on genetically unimproved and undomesticated populations. This difference between aquaculture and livestock production is in spite of the fact that the basic

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elements of breeding theory are the same for fish and shellfish as for farm animals. One possible reason for the difference is the complexity of reproductive biology in aquatic species, and special consideration needs to be taken in the design of breeding plans for these species. Since 1971 AKVAFORSK, has continuously carried out large scale breeding research projects with salmonid species, and during the latest 15 years also with a number of fresh water and marine

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species. Results from this work and the results from other institutions around the world have brought forward considerable knowledge, which make the development of efficient breeding programs feasible. The genetic improvement obtained in selection programs for fish and shellfish is remarkable and much higher than what has been achieved in terrestrial farm animals.

"A text for a one-semester course in population genetics. It introduces students to classical

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population genetics (in terms of allele and haplotype frequencies) and modern population genetics (in terms of coalescent theory). It presents numerous applications of population genetic methods to practical problems, including testing for natural selection, detecting genetic hitchhiking and inferring the history of populations"--Provided by publisher.

Crime Laboratory Digest
Molecular Ecology and
Evolution

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Fish biology in Japan: an
anthology in honour of
Hiroya Kawanabe

Canadian Journal of
Fisheries and Aquatic
Sciences

Sport Fishery Abstracts

**This concise introduction
addresses the theories
behind population genetics
and relevant empirical
evidence, genetic drift,
natural selection, nonrandom
mating, quantitative
genetics, and the
evolutionary advantage of
sex.**

**Biological evolution is a
fact—but the many
conflicting theories of
evolution remain**

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controversial even today. When *Adaptation and Natural Selection* was first published in 1966, it struck a powerful blow against those who argued for the concept of group selection—the idea that evolution acts to select entire species rather than individuals. Williams’s famous work in favor of simple Darwinism over group selection has become a classic of science literature, valued for its thorough and convincing argument and its relevance to many fields outside of biology. Now with a new foreword by Richard Dawkins, *Adaptation and Natural*

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**Selection is an essential
text for understanding the
nature of scientific debate.
Proceedings of the Second
International Conference on
Indo-Pacific Fishes :
Conducted at the Tokyo
National Museum Ueno Park,
Tokyo, July 29-August 3,
1985**

**Investigations in general
biology**

Population Genetics

Biology for AP ® Courses

**A Bibliography of Publicly
Available Literature**

**Pertaining to the USAEC's
Oak Ridge, Tenn, . Site**

**An Introduction to
Population Genetics Theory**

*A respected resource for decades, the Guide
for the Care and Use of Laboratory*

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Animals has been updated by a committee of experts, taking into consideration input from the scientific and laboratory animal communities and the public at large. The Guide incorporates new scientific information on common laboratory animals, including aquatic species, and includes extensive references. It is organized around major components of animal use: Key concepts of animal care and use. The Guide sets the framework for the humane care and use of laboratory animals. Animal care and use program. The Guide discusses the concept of a broad Program of Animal Care and Use, including roles and responsibilities of the Institutional Official, Attending Veterinarian and the Institutional Animal Care and Use Committee. Animal environment, husbandry, and management. A chapter on this topic is now divided into sections on terrestrial and aquatic animals and provides recommendations for housing

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and environment, husbandry, behavioral and population management, and more. Veterinary care. The Guide discusses veterinary care and the responsibilities of the Attending Veterinarian. It includes recommendations on animal procurement and transportation, preventive medicine (including animal biosecurity), and clinical care and management. The Guide addresses distress and pain recognition and relief, and issues surrounding euthanasia. Physical plant. The Guide identifies design issues, providing construction guidelines for functional areas; considerations such as drainage, vibration and noise control, and environmental monitoring; and specialized facilities for animal housing and research needs. The Guide for the Care and Use of Laboratory Animals provides a framework for the judgments required in the management of animal facilities. This updated and expanded resource of proven

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value will be important to scientists and researchers, veterinarians, animal care personnel, facilities managers, institutional administrators, policy makers involved in research issues, and animal welfare advocates.

Investigations in General Biology presents an overview of studies in general biology, including behavior, biological models, cell activities, organization of plants and animals, population genetics, and evolution. The opening chapters deal with the significance of accurate observations of systematic ordering of biological events in plants and animals. The use of laboratory tools for biological analysis and the application of such tools in biological diffusion process are also considered. This book describes the use of model to investigate cellular phenomenon and an application of a valid model of cell membrane function using microscope. The

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responses in solutions of different concentrations are recorded. Considerable chapters discuss refined experimental approach to testing a biological hypothesis, with emphasis on the idea of using a control. The control indicates the amount of response that occurs due to variables not anticipated. Furthermore, this book discusses the organization of the flowering plant, including those organs involved in maintenance as well as animal organization, particularly, in crayfish and frog. It presents the proper statistical procedures that can be used by geneticist to determine probability genetic ratio. It explains gene frequencies of characters in human populations and consequences of nonrandom reproduction and subsequent departure from Hardy-Weinberg equilibrium. Finally, the concluding chapters deal with physiological attributes and classification of animal and plant

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population. General biology students and instructors will greatly benefit from this book.

Biology, Evolution, and Ecology

Methods for Fish Biology

A Concise Guide

Genetics Abstracts

Journal Canadien Des Sciences Halieutiques

Et Aquatiques

Foreign Shrimp Fisheries, Other Than

Central and South America

Biology for AP® courses

covers the scope and sequence

requirements of a typical two-

semester Advanced

Placement® biology course.

The text provides

comprehensive coverage of

foundational research and core

biology concepts through an

evolutionary lens. Biology for

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AP[®] Courses was designed to meet and exceed the requirements of the College Board's AP[®] Biology framework while allowing significant flexibility for instructors. Each section of the book includes an introduction based on the AP[®] curriculum and includes rich features that engage students in scientific practice and AP[®] test preparation; it also highlights careers and research opportunities in biological sciences.

Quantitative Ecotoxicology, Second Edition explores models and methods of quantitative ecotoxicology at

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progressively higher biological scales using worked examples and common software packages. It complements the author's previous books, Fundamentals of Ecotoxicology, Third Edition and Ecotoxicology: A Comprehensive Treatment. Encouraging a more rigorous inferential approach to research, the book examines the quantitative features of the science of ecotoxicology. The first chapters lay the foundation by introducing fundamental concepts and definitions. The author traces the historical perspective, rationale, and characteristics

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of scientific ecotoxicology as well as the general measurement process. He also considers methodologies for defining and controlling variance, which could otherwise exclude valid conclusions from ecotoxicological endeavors. The book then discusses ecotoxicological concepts at increasing levels of ecological organization and outlines quantitative methods used to measure toxicant accumulation and effects. Reflecting the importance of establishing type I and type II error rates, it highlights design issues, particularly

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sample size and power estimation. The final chapter summarizes the book with a brief discussion of ecotoxicology from a nonregulatory perspective. Extensively updated, this second edition has been expanded to include terrestrial as well as aquatic ecotoxicology. Requiring only a basic knowledge of statistics, this highly readable book is suitable for graduate students and researchers as well as practicing environmental scientists and engineers. It guides readers to better understand the fate and effects of toxicants in the

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*biosphere—and helps them
frame this understanding in
quantitative terms. What's
New in This Edition More than
40 new figures and 20 new
worked examples Updated
measurement quality methods
and software Expanded
coverage of synecological
models and methods More
integration of Bayesian
concepts Appendices for
power analysis and basic
matrix methods Additional
mixture toxicity and up-and-
down methods Greatly
expanded discussion of
significance testing Expanded
discussion of metapopulations
Matrix tools for population*

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*demography Light isotope-
based models for trophic
transfer of toxicants Inclusion
of metacommunity and SHE
analysis techniques R script
examples by Eduard Szöcs
(University Koblenz-Landau)
available at <http://edild.github.io/blog/categories/quantitative-ecotoxicology-with-r/>
California Fish and Game
Genetic Studies of Fish
The Organismal Side :
Selected Writings from the
Avisé Laboratory
An Introduction to Population
Genetics
Clear Lake, Lake County,
California
A Critique of Some Current*

Evolutionary Thought

This volume is a reprinted collection of 69 ?classics? from the Avise laboratory, chosen to illustrate a trademark brand of research that harnesses molecular markers to scientific studies of natural history and evolution in the wild. Spanning the early 1970s through the late 2000s, these articles trace how the author and his colleagues have used molecular genetics techniques to address multifarious conceptual topics in genetics, ecology, and evolution, in a fascinating menagerie of creatures with oft-peculiar lifestyles. The organisms described in this volume range from blind cavefish to male-pregnant pipefishes and sea spiders, from clonal armadillos to natal-

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homing marine turtles, from hermaphroditic sea snails to hybridizing monkeys and tree frogs, from clonal marine sponges to pseudohermaphroditic mollusks to introgressing oysters, and from endangered pocket gophers, terrapins, and sparrows to unisexual (all-female) fish species to ?living-fossil? horseshoe crabs, and even to a strange little fish that routinely mates with itself. The conceptual and molecular topics addressed in this volume are also universal, ranging from punctuated equilibrium to coalescent theory to the need for greater standardization in taxonomy, from cytonuclear disequilibrium statistics to the ideas of speciation duration and sympatric speciation, from historical

population demography to phylogenetic reconstructions of males' sexual ornaments, from the population genetic consequences of inbreeding to Pleistocene effects on phylogeography, and from the molecular underpinnings of null alleles to the notion of clustered mutations that arise in groups to compelling empirical evidence for the unanticipated processes of gene conversion and concerted evolution in animal mitochondrial DNA. Overall, this collection includes many of the best, most influential, sometimes controversial, occasionally provocative, always intriguing, or otherwise entertaining publications to have emerged from the Avise laboratory over the last four decades.

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Thus, this book conveys, through the eyes of one of the field's longstanding pioneers, what the organismal side of molecular ecology and evolution really means.

Fisheries genetics researchers will find invaluable the thirty-eight peer-reviewed contributions in this book, presented at the 20th Lowell Wakefield Fisheries Symposium "Genetics of Subpolar Fish and Invertebrates," held in May 2002 in Juneau, Alaska. Looming over concerns of lost fisheries stocks and persistent erosion of genetic variability are predictions of global warming, which may further tax genetic resources. One consequence is an increased reliance on genetic applications to many aspects of

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fisheries management, aquaculture, and conservation. The contributions in this book are important to modern fisheries science and genetics, and illustrate the evolution of the field over the past decade. The improved technology provides tools to address increasingly complicated problems in traditional applications and ecological and behavioral studies. The union between molecular and quantitative genetics, where many of the major questions about population structure and evolution remain unanswered, will also benefit from the new technologies.

Fishery Bulletin

Fish-marking Techniques

The Diversity of Fishes

The Fisheries Society of the British

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*Isles Annual Symposium, Held in
Jesus College, Cambridge, U.K., 24-28
July 2000*

*Whales, Seals, Fish and Man
Quantitative Ecotoxicology, Second
Edition*

**Adaptation and Natural
Selection A Critique of
Some Current
Evolutionary
Thought Princeton
University Press
Proceedings of the
International Symposium
on Genetics of Subarctic
Fish and Shellfish
On Concept Vs. Belief**