**INTEGRATIVE BIOLOGY (IB)**

**IB 501, RESEARCH, 1-16 Credits**
Graduate-level research completed under faculty supervision.
Equivalent to: Z 501
This course is repeatable for 16 credits.

**IB 503, THESIS, 1-16 Credits**
Master's thesis, completed under faculty supervision.
Equivalent to: Z 503
This course is repeatable for 999 credits.

**IB 505, READING AND CONFERENCE, 1-16 Credits**
For graduate students working toward a master's degree. After arrangements with individual faculty, readings and discussions on topics of mutual interest.
Equivalent to: Z 505
This course is repeatable for 16 credits.

**IB 506, PROJECTS: OUTREACH, 1-16 Credits**
Graded P/N.
Equivalent to: BI 506
This course is repeatable for 16 credits.

**IB 507, SEMINAR, 1-16 Credits**
Graded P/N.
Equivalent to: Z 507
This course is repeatable for 16 credits.

**IB 510, INTERNSHIP, 1-16 Credits**
Equivalent to: Z 510
This course is repeatable for 16 credits.

**IB 511, INTEGRATIVE BIOLOGY GRADUATE STUDENT ORIENTATION, 2 Credits**
Introduction to the graduate program in Integrative Biology and at OSU in general. Class introduces students to various skills for success in graduate school and beyond. Exploration of career options for those holding a degree in IB are explored. Graded P/N.

**IB 512, INTEGRATIVE BIOLOGY GTA TRAINING AND DEVELOPMENT, 1 Credit**
Provides instructional support and professional development for first year graduate teaching assistants (GTAs) in Integrative Biology. Focuses on developing a foundation for quality instruction, facilitation, and leadership as GTAs and professionals. Best practices, skills, theory and knowledge necessary for effective teaching, facilitation, and assessment of student learning are explored.
This course is repeatable for 3 credits.

**IB 513, GRANT WRITING AND ETHICS, 3 Credits**
Participants will write and submit a grant proposal by the end of the term. We discuss the main components of a typical grant proposal. Participants read and critique proposal drafts written by participants. Ethical issues are discussed as they are encountered.
Equivalent to: Z 585
This course is repeatable for 6 credits.

**IB 515, SCIENCE COMMUNICATION: MAKING YOUR SCIENCE MATTER, 2 Credits**
A practical, hands-on course designed to help science graduate students build knowledge and skills for engaging with audiences beyond their scientific peers. The science of science communication, the cultures of journalism and public policy, the changing roles of scientists in society, and science advocacy will be explored through lectures, invited talks, in-class discussions and exercises.

**IB 518, SCIENCE AND POLICY, 2 Credits**
An introduction to the science-policy interface in a 'post-truth' society. The formulation of state and federal public policy is examined, as well as the role of science and scientist in informing policy, management decisions and public understanding. Current topics are emphasized.

**IB 522, COMPARATIVE/FUNCTIONAL VERTEBRATE ANATOMY, 5 Credits**
Phylogenetically-based study of the form and function of vertebrate organ systems, including integumentary, musculoskeletal, cardiopulmonary, digestive, and sensory. Lab emphasizes comparative form through dissection, and function through non-invasive experimentation. Lec/lab.
Equivalent to: Z 522

**IB 523, ENVIRONMENTAL PHYSIOLOGY, 3 Credits**
Comparative environmental physiology of animals with emphasis on adaptations to such aspects of the physical environment as temperature, water, ions, and gases. Consideration given to interactions between physiology and environment that influence the local and geographic distribution of animals.
Equivalent to: Z 523

**IB 525, EMBRYOLOGY AND DEVELOPMENT, 5 Credits**
Equivalent to: Z 525
IB 527, PALEOBIOLOGY, 0-4 Credits
Fossils provide a direct window into the evolution, extinction, and ecology of past life on Earth. A process-based study of the marine and terrestrial fossil record is taken to explore the topics of preservation, macroevolution, extinction of biotas, biomechanics, paleoecology, and climate change. Required laboratory and weekend field trip.
Equivalent to: BI 527

IB 531, VERTEBRATE PHYSIOLOGY I, 4 Credits
Systems/concepts covered include motor reflexes, autonomic nervous system, digestion/metabolism, renal and osmoregulatory, endocrine and reproductive systems. First in IB 531, IB 532 series.
Equivalent to: Z 532

IB 532, VERTEBRATE PHYSIOLOGY II, 3 Credits
Systems/concepts covered include blood, immune, lymphatic, cardiovascular, and pulmonary. Second in the IB 531, IB 532 series.
Equivalent to: Z 532

IB 538, BEHAVIORAL NEUROBIOLOGY, 3 Credits
Equivalent to: Z 538

IB 540, INSECT PHYSIOLOGY, 3 Credits
Fundamentals of insect physiology from the behavioral to the molecular level. Cellular physiology and hormonal control of molting, metamorphosis and reproduction. Overview of body functions: respiration, circulation, digestion, metabolism, and osmoregulation. Physiological basis of behavior: muscles and flight, structure and functions of the nervous system, sensory physiology and chemical communication. The contributions of insect physiology to general physiological principles and biorational methods of insect pest control are discussed.
Equivalent to: Z 540

IB 545, EVOLUTION, 3 Credits
Formal analysis of genetic and ecological mechanisms producing evolutionary change; special topics include speciation, ecological constraints, adaptive radiations, paleontology, biogeography, the origin of life, molecular evolution, and human evolution.
Equivalent to: BI 545

IB 551, FUNCTIONAL ANATOMY OF THE HUMAN MUSCULAR SYSTEM, 4 Credits
In-depth dissection of the orientation, innervation, and functional significance of muscles and muscle groups. Topics include muscle identification, joint anatomy and variation of human form. IB 551 student expectations include vascularization and detailed joint anatomy. The laboratory component will consist of the dissection of the muscular anatomy of a human cadaver. Lab fee. Lec/lab.
Equivalent to: BI 551
Recommended: ((BI 231 and 241) or (BI 331 and 341)) and ((BI 232 and 242) or (BI 332 and 342)) and ((BI 233 and 243) or (BI 333 and 343))

IB 554, EVOLUTIONARY GENOMICS, 3 Credits
Examines the evolutionary forces that have produced such varied and complex genomes across the tree of life. The processes by which genomes can be structured, maintained, and remodeled (by nature or by humans) are explored through scientific literature. Special emphasis will be given to recent technological advances in genomics, along with their potential impacts on individuals and society.
Equivalent to: BI 555

IB 556, PHYLOGENETICS, 4 Credits
Explores the theory and practice of modern phylogenetic analysis. Emphasis placed on tree reconstruction algorithms, assessment of statistical support, and contemporary issues in phylogenetics. Lab will focus on the use of phylogenetic software and the analysis of molecular data sets. Lec/lab.
Equivalent to: BI 556

IB 561, MARINE AND ESTUARINE INVERTEBRATE ZOOLOGY, 4 Credits
Comparative survey of eight major invertebrate phyla and many lesser-known phyla. Areas of emphasis will be 1) invertebrate identification, 2) natural history (diversity, habitat, feeding, behavior), and 3) comparative anatomy (adaptive significance of morphological structures). Laboratories and field trips will strongly supplement lecture material. Lec/lab. Taught at Hatfield Marine Science Center.
Equivalent to: Z 561

IB 573, HERPETOLOGY, 3 Credits
World families and distribution of amphibians and non-avian sauropods; evolution, population biology, life histories, current literature.
Equivalent to: Z 573

IB 574, SYSTEMATIC HERPETOLOGY, 2 Credits
A survey of the phylogenetic diversity of amphibians and reptiles of the United States. Identification through the use of keys will be stressed. Field trip fee. Lab fee. Lec/lab.
Equivalent to: Z 574

IB 577, AQUATIC ENTOMOLOGY, 4 Credits
Biology, ecology, collection, and identification of aquatic insects. Two required Saturday field trips. Lec/lab.
Equivalent to: Z 577

IB 581, BIOGEOGRAPHY, 3 Credits
Biogeography is the study of the distribution of biodiversity. We focus on abiotic (geological, climatological) and biotic (ecological, evolutionary) factors that govern diversity across space and through time, emphasizing assembly of communities, global change, and conservation in today's rapidly changing world. The course format includes lecture, computer-based activities, and discussion. Offered winter term in odd years.
Equivalent to: BI 581

IB 583, POPULATION BIOLOGY, 3 Credits
Theoretical and empirical views of the structure and function of populations from across the tree of life, emphasizing the integration of ecological and evolutionary approaches. Lec.
Equivalent to: BI 583
**IB 592, THEORETICAL ECOLOGY, 4 Credits**
A treatment of the central concepts of theoretical ecology, with emphasis on the analysis and modeling of single populations and multispecies communities. Topics include discrete- and continuous-time models of population growth, stochastic and deterministic processes, and the response of populations and communities to pulse and press perturbations.
Equivalent to: BI 592

**IB 593, BEHAVIORAL ECOLOGY, 5 Credits**
Behavioral ecology with emphasis on both theoretical and empirical approaches. Offered alternate years.
Equivalent to: Z 593

**IB 594, COMMUNITY ECOLOGY, 5 Credits**
Theory and analysis of multispecies associations. Emphasis on extent to which existing ecological theory is supported by natural phenomena. Course considers how biotic and abiotic mechanisms interact to regulate community organization and stability in marine, freshwater, and terrestrial habitats. Offered alternate years.
Equivalent to: Z 594

**IB 595, DISEASE ECOLOGY, 3 Credits**
An introduction to disease ecology—the study of disease processes in natural populations and communities. The course focuses on (I) the role parasites play in the ecology and evolution of animal populations, including humans; and (II) the relevance of ecological and evolutionary considerations in managing infectious diseases.
Equivalent to: BI 595

**IB 599, SPECIAL TOPICS, 1-16 Credits**
Topics and credits vary. Grading mode TBA. Taught at Hatfield Marine Science Center and Corvallis campus.
Equivalent to: Z 599
This course is repeatable for 16 credits.

**IB 601, RESEARCH, 1-16 Credits**
Doctoral-level research under faculty supervision. Graded P/N.
Equivalent to: Z 601
This course is repeatable for 16 credits.

**IB 603, THESIS, 1-16 Credits**
Doctoral thesis completed under faculty supervision.
Equivalent to: Z 603
This course is repeatable for 999 credits.

**IB 605, READING AND CONFERENCE, 1-16 Credits**
For graduate students working toward doctoral degree. After arrangements with individual faculty, readings and discussions on topics of mutual interest.
Equivalent to: Z 605
This course is repeatable for 16 credits.