

**PHYSIOLOGY: Suggested Courses for 2019-2020**

Course	Title	Description	Quarter Offered	Units	Prereqs
**NPB 128	Comparative Physiology: Endocrinology	Comparison of physiological functions in the animal kingdom: animal hormones and their functions.	W	3	NPB 101
**NPB 130	Physiology of the Endocrine Glands	Advanced presentation of concepts in endocrinology with emphasis on the role of hormones in reproduction, metabolism, and disease.	F	4	NPB 101/ANS 100

**\*\*Students should take either or both classes listed above.**

Course	Title	Description	Quarter Offered	Units	Prereqs
ANS 103	Animal Welfare	The application of principles of animal behavior and physiology to assessment and improvement of the welfare of wild, captive, and domestic animals. Topics include animal pain, stress, cognition, motivation, emotions, and preferences; as well as environmental enrichment methods.	W	4	ANS 104 or NBP 102 or equiv.
ANS 125	Equine Exercise Physiology	Basic and applied physiology of the exercising horse. Includes physiological systems, gait analysis, lameness, pharmacology, sports medicine; sport horse performance evaluation and conditioning.	W, EOY odd	3	NPB 101/ANS 100
ANS 127	Advanced Equine Reproduction	Provides in-depth knowledge of the reproductive physiology, anatomy and endocrinology of the mare and stallion. Emphasis on structure/function relationships as they are applied to improving equine reproductive management and efficiency.	S	3	NPB101/ANS100, ANS115
ANS 198 (133)	Animal Cell Culture Laboratory	Techniques of cell culture, with emphases on cell physiology and the actions of drugs and toxicants on cultured somatic cells. Design, performance and interpretation of experiments with animal cells in vitro.	W	4	ABI102, ABI 103, NPB 101/ANS100
ANS 170	Ethics of Animal Use	Ethical issues relating to animal use in contemporary society. Integration of philosophical theories with scientific evidence relating to animal behavior, mentality, and welfare. Uses of animals in agriculture, research, and as companions. Ethical responsibilities regarding wildlife and the environment.	F, S	4	Writing Course

AVS 100	Avian Biology	Survey of avian natural history and study of the diversity, functional morphology, behavior, ecology and evolution of birds.	S	3	BIS 2AB
BIS 104	Regulation of Cell Function	Membrane receptors and signal transduction; cell trafficking; cell cycle; cell growth and division; extracellular matrix and cell-cell junction; cell development; immune system.	All	3	BIS 101, ABI102/BIS102
ETX 103A	Biological Effects of Toxicants	Biological effects of toxic substances in living organism. Metabolism, cellular and tissue targets, mechanisms of action, and pathological effects. Not open for students who have completed course 114B.	W	4	BIS102/ABI 102, (ETX101 and NPB101 rec.)
EXB 101	Exercise Physiology	Physiologic responses to acute exercise and physiological adaptations to both chronic exercise (training) and selected environmental stresses. Emphasis on the muscular, metabolic, cardiovascular, respiratory and renal responses and adaptations to exercise.	F, S	4	CHE8B, BIS1A/BIS2A
GDB 103	The Microbiome	Examination of the structure and function of microbial communities that live inside and on host organisms. Introduction to general concepts of the microbiome and microbiota, and their relationship to host health and disease.	W	3	BIS 2ABC
MCB 123	Behavior and Analysis of Enzyme and Receptor Systems	Introduction to the principles of enzyme kinetics and receptor-ligand interactions with emphasis on metabolic regulation and data analysis. Topics include simultaneous equilibria, chemical and steady-state kinetics, allosteric enzymes, multi-reactant systems, enzyme assays, membrane transport and computer-assisted simulations and analyses.	F, S	3	BIS103/ABI103

NPB 100	Neurobiology	Brains and nervous systems, neurons and neural circuits. Vision, hearing, and feature extraction by the central nervous system. Development of nervous systems. Coordination of movement. The cell biology of learning and memory. Perception, cognition, and disorders of the brain.	All	4	BIS 2A (PHY 7AB rec.)
NPB 113	Cardiovascular, Respiratory, and Renal Physiology	An intense and advanced presentation of concepts in cardiovascular, respiratory, and renal physiology including discussion of acid-base balance.	F	4	NPB 101, CHE 8B, (PHY 7BC rec.)
NPB 114	Gastrointestinal	Gastrointestinal anatomy and physiology. Digestion, secretion,	F, SuI	3	NPB 101

	Physiology	absorption, motility, comparative physiology and pathology. Strong emphasis on neural and hormonal regulation and on cellular mechanisms of secretion and absorption.			(BIS103/ABI 103 rec.)
NPB 117	Avian Physiology	Physiology of the various systems of birds with emphasis on digestion, respiration, excretion, and endocrine systems.	NCO*	3	BIS 2AB, CHE 2B; NPB101/ANS 100 rec.
NPB 123/ APC 100	Comparative Vertebrate Organology	Functional anatomy of major organ systems in vertebrates. Each system examined from cellular to gross level in fish, birds, and mammals. Emphasis on how differentiated cell types are integrated into tissues and organs to perform diverse physiological functions.	F	4	BIS 2AB
NPB 124/ PSC 124	Comparative Neuroanatomy	Overview of the Neuroanatomy of the nervous system in a variety of mammalian and non-mammalian vertebrates. Examine changes of modifications to neural structures as a result of morphological or behavioral specializations.	W	4	PSC 101 or NPB 101
NPB 132	Nature vs. Nurture: Physiological Interactions Among Genes, Nutrients, and Health	Biochemical, physiological, genetic, and nutritional causes of important medical problems such as obesity, anorexia, heart disease, and diabetes.	F	3	BIS 2A or consent
NPB 140	Principles of Environmental Physiology	Physiological aspects of interactions of organisms and environmental, cellular, system, and organismal levels. Emphasis on regulatory responses/ mechanisms to thermal, pressure, gravity and light environmental variables. Not open for credit to students who have completed course 148.	W	3	NPB 101 (BIS 102/ABI 102 rec.)
NPB 152/ PSC 123	Hormones and Behavior	Endocrine physiology with an emphasis on the principles of behavior. Fundamental relationships between hormones and various behaviors engaged in the organism during its lifetime. Role of hormones in behavioral homeostasis, social behavior, adaptation to stress.	S, SuI	3	NPB 101/ANS100, NPB 102 or PSC 101

NPB 168	Neurobiology of Addictive Drugs	Neurobiological basis for the effects and mechanisms of action of drugs with addictive potential, including opiates (morphine, heroin, methadone), amphetamines, cocaine, nicotine, marijuana (cannabinoids), alcohol, caffeine, and mind-altering drugs such as LSD and antidepressants.	F, W, S. SuI	4	NPB 100 or NPB 101 or equiv.
NUT 122	Ruminant Nutrition and Digestive Physiology	Study of nutrient utilization as influenced by the unique aspects of digestion and fermentation in ruminants, both domestic and wild. Laboratories include comparative anatomy, feed evaluation, digestion kinetics using fistulated cows, computer modeling, and microbial exercises.	S	4	ABI 103/BIS 103, BIS 2C, NPB 101/ANS 100 (MAT16B rec.)
NUT 123	Comparative Animal Nutrition	Comparative nutrition of animals; including laboratory, companion, zoo, and wild animals. Digestion and metabolic adaptations required for animal species to consume diverse diets ranging from grasses and leaves to nectar to insects and meat. Relation of nutrition to metabolic adaptations and physiological states, including growth, reproduction, and diseases.	S	3	ABI 103/BIS 103
NUT 123L	Comparative Animal Nutrition Laboratory	Laboratory exercises leading to written reports on establishment of nutritional requirements and formulation of complete diets for laboratory, companion, zoo and wild animals.	S	1	ABI 103/BIS 103, NUT 123 (conc. ok)
PMI 126	Fundamentals of Immunology	Overview of immunology including components of the immune system, initiation and regulation of the immune response, infection and immunity, hypersensitivity and immune dysfunction. Clinical immunologic techniques, immunodeficiency and vaccinology.	W	3	BIS 102/ABI 102 or consent
PSC 121	Physiological Psychology	Relationship of brain structure and function to behavior, motivation, emotion, language, and learning in humans and other animals. Methodology of physiological psychology and neuroscience. **Pass 1 major restricted.	All	4	PSC 1, PSC 41, PSC 101

VMB 101Y	Principles of Pharmacology and Toxicology	This <b>hybrid</b> course provides training in core concepts of pharmacological and toxicological sciences. Develop higher-order problem solving and critical thinking skills.	S	3	Upper Div standing, CHE 8AB, BIS 2ABC
VMB 101V	Principles of Pharmacology and Toxicology	This <b>virtual</b> course provides training in core concepts of pharmacological and toxicological sciences. Develop higher-order problem solving and critical thinking skills.	F	3	Upper Div standing, CHE 8AB, BIS 2ABC