Zoology (ZOOL)

**ZOOL 1090**
**BB Introduction to Human Anatomy and Physiology**
3:3:0 **Fall, Spring, Summer**
* Prerequisite(s): BIOL 1010 or BIOL 1610

Presents a basic introduction to the sciences of anatomy and physiology. Covers the basic structure and function of the human body at the cellular, tissue, organ, and system levels. Provides a foundation of particular value for pre-nursing students who wish to have a preview of their required life science courses.

**ZOOL 2320**
**Human Anatomy BB**
3:3:0 **Fall, Spring, Summer**
* Prerequisite(s): BIOL 1610 and (ENGL 1010 or ENGH 1005) with a minimum of C- or written permission of the Anatomy program coordinator
* Corequisite(s): ZOOL 2325

Studies, in-depth, the anatomy of the human body. Covers the structure and some functions at the cellular, tissue, organ, and system levels. Emphasizes the names, locations, and functions of body components. Involves problem solving and analytical thinking. Includes weekly laboratory study of human cadavers, models, and specimens. Canvas Course Mats $78/McGraw applies.

**ZOOL 2325**
**Human Anatomy Laboratory**
1:0:3 **Fall, Spring, Summer**
* Corequisite(s): ZOOL 2320

Studies, in-depth, the anatomy of the human body. Covers the structure and some functions at the cellular, tissue, organ, and system levels. Emphasizes the names, locations, and functions of body components. Involves problem solving and analytical thinking. Includes weekly laboratory study of human cadavers, models, and specimens. Course Lab fee of $30 applies.

**ZOOL 232H**
**Human Anatomy**
3:3:0 **Fall, Spring**
* Prerequisite(s): BIOL 1610, (ENGL 1010 or ENGH 1005 or written permission of the Anatomy program coordinator), a minimum of a C- required in prerequisite courses.
* Corequisite(s): ZOOL 232L laboratory section; at least one semester of college level experience is highly recommended.

For students who intend to pursue careers in the bio-medical sciences; especially pre-nursing, pre-med, pre-dent, and pre-vet students. Emphasizes the role and value of anatomical knowledge in health and disease. Covers the same general material as ZOOL 2320, but emphasizes clinical applications of the information. Students will choose and complete a course project that may involve short written reports, a term paper, or a poster presentation. Includes weekly laboratory study of human cadavers, models, and specimens. Canvas Course Mats $78/McGraw applies.

**ZOOL 232L**
**Human Anatomy Honors Laboratory**
1:0:3 **Fall, Spring**
* Prerequisite(s): BIOL 1010 or BIOL 1610, ENGL 1010 or ENGH 1005 or written permission of the Anatomy program coordinator.
* Corequisite(s): ZOOL 232H

For students who intend to pursue careers in the bio-medical sciences; especially pre-nursing, pre-med, pre-dent, and pre-vet students. Emphasizes the role and value of anatomical knowledge in health and disease. Covers the same general material as ZOOL 2320, but emphasizes clinical applications of the information. Students will choose and complete a course project that may involve short written reports, a term paper, or a poster presentation. Includes weekly laboratory study of human cadavers, models, and specimens. Course Lab fee of $30 applies.

**ZOOL 2420**
**Human Physiology**
3:3:0 **Fall, Spring, Summer**
* Prerequisite(s): BIOL 1610 with a minimum grade of C- and CHEM 1110 with a minimum grade of C-
* Corequisite(s): ZOOL 2425

Studies the functions of the human body at the cellular, tissue, organ, and system levels. Emphasizes the role and value of anatomical knowledge in health and disease. Covers the same general material as ZOOL 2320, but emphasizes clinical applications of the information. Students will choose and complete a course project that may involve short written reports, a term paper, or a poster presentation. Includes weekly laboratory study of human cadavers, models, and specimens. Canvas Course Mats $78/McGraw applies.

**ZOOL 2425**
**Human Physiology Laboratory**
1:0:3 **Fall, Spring, Summer**
* Prerequisite(s): BIOL 1610 and CHEM 1110
* Corequisite(s): ZOOL 2420

Accompanies ZOOL 2420. Covers topics that include the scientific method, scientific data presentation, diffusion and osmosis, enzymatic function, buffers, neurotransmission, skeletal and cardiac muscle physiology, hematology, respiratory physiology and renal physiology. Course Lab fee of $24 applies.

**ZOOL 242H**
**Human Physiology**
3:3:0 **On Sufficient Demand**
* Prerequisite(s): BIOL 1610 with a minimum grade of C- and CHEM 1110 with a minimum grade of C-, written permission of the physiology program coordinator
* Corequisite(s): ZOOL 2425

Studies the functions of the human body at the chemical, cellular, organ, and system levels. Explores control mechanisms involved in homeostasis and stimulus/response pathways. Involves problem solving and analytical thinking. Includes weekly laboratory. Requires a term paper, project, or presentation.

**ZOOL 242L**
**Human Physiology Laboratory**
1:0:3 **On Sufficient Demand**
* Prerequisite(s): BIOL 1010 (or BIOL 1610), CHEM 1110, written permission of the physiology program coordinator.
* Corequisite(s): ZOOL 242H

Studies the functions of the human body at the chemical, cellular, organ, and system levels. Explores control mechanisms involved in homeostasis and stimulus/response pathways. Involves problem solving and analytical thinking. Includes weekly laboratory. Course Lab fee of $24 applies.

**ZOOL 3100**
**Vertebrate Zoology**
3:3:0 **Spring, Summer**
* Prerequisite(s): (BIOL 1010 or BIOL 1620) with a C- or higher and University Advanced Standing
* Corequisite(s): ZOOL 3105

Designed for intended Biology or Zoology majors who desire a broad introduction to the vertebrates and a greater understanding of their unique structure, distribution and the importance of these organisms in the present and past history of the Earth. Covers the evolutionary development of the vertebrates pertaining to major skeletal and physiological adaptations. The approach is also ecological as to vertebrate habitat requirements, their distribution, and community roles. Includes weekly laboratory.
ZOOL 3105
Vertebrate Zoology Laboratory
1:0:2 Spring, Summer
* Prerequisite(s): University Advanced Standing
* Corequisite(s): ZOOL 3100
Provides students with hands-on laboratory experience in classification and identification of vertebrates. Course Lab fee of $26 applies.

ZOOL 3200
Invertebrate Zoology
3:3:0 Fall
* Prerequisite(s): BIOL 1620 with a C- or higher and University Advanced Standing
* Corequisite(s): ZOOL 3205 Invertebrate Zoology Laboratory
Intended for Biology Department majors. Covers the anatomy, physiology, systematics, evolution and ecology of invertebrate animals.

ZOOL 3205
Invertebrate Zoology Laboratory
1:0:3 Fall
* Prerequisite(s): BIOL 1620 with a C- or higher and University Advanced Standing
* Corequisite(s): ZOOL 3200 Invertebrate Zoology
Covers the anatomy, physiology, systematics, evolution and ecology of invertebrate animals. Course Lab fee of $25 applies.

ZOOL 3300
Herpetology
3:3:0 On Sufficient Demand
* Prerequisite(s): BIOL 1620 with minimum grade of C-, and University Advanced Standing
* Corequisite(s): ZOOL 3305 Herpetology Laboratory
Covers the evolution, ecology, and diversity of reptiles and amphibians. Includes active class discussions, oral presentations. Emphasizes native Utah herpetofauna. Must be taken concurrently with weekly laboratory and required field trips.

ZOOL 3305
Herpetology Laboratory
1:0:2 On Sufficient Demand
* Prerequisite(s): BIOL 1620 with minimum grade of C-, and University Advanced Standing
* Corequisite(s): ZOOL 3300 Herpetology
Covers the evolution, ecology, and diversity of reptiles and amphibians. Includes active class discussions, oral presentations, and field trips. Emphasizes native Utah herpetofauna. Must be taken concurrently with lecture. Course Lab fee of $40 for transportation, support, and lab applies.

ZOOL 3430
Entomology
3:3:0 On Sufficient Demand
* Prerequisite(s): BIOL 1620 and BIOL 1625 with a minimum grade of C- in each, and University Advanced Standing
* Corequisite(s): ZOOL 3435
Introduces the study of insects, including insect diversity and classification, anatomy and physiology, relationships to other animals and plants, behavior, and ecology. Includes the application of the study of insects to pest management, environmental assessment, and forensic investigations.

ZOOL 3435
Entomology Laboratory
1:0:2 On Sufficient Demand
* Prerequisite(s): University Advanced Standing
* Corequisite(s): ZOOL 3430
Introduces the study of insects, including insect diversity and classification, anatomy and physiology, relationships to other animals and plants, behavior, and ecology. Includes the application of the study of insects to pest management, environmental assessment, and forensic investigations.

ZOOL 3500
Mammalogy
3:3:0 Fall, Spring, Summer
* Prerequisite(s): BIOL 1620 with a minimum grade of C-, and University Advanced Standing; ZOOL 3100 and ZOOL 3105 strongly recommended
* Corequisite(s): ZOOL 3505
Explores the taxonomy, morphology, behavior, ecology, evolution, development, and conservation of mammals. Includes three weekly lectures and a weekly laboratory.

ZOOL 3505
Mammalogy Laboratory
1:0:2 Fall
* Prerequisite(s): University Advanced Standing
* Corequisite(s): ZOOL 3500
Explores the taxonomy, morphology, behavior, ecology, evolution, development, and conservation of mammals. Includes three weekly lectures and a weekly laboratory. Course Lab fee of $56 for transportation, lab applies.

ZOOL 3600 (Cross-listed with: FSCI 3600)
Forensic Anthropology I
3:1:2 On Sufficient Demand
* Prerequisite(s): ZOOL 1090, or ZOOL 2320 and ZOOL 2325, University Advanced Standing
Provides instruction on the study of human bones and their remains as physical evidence in criminal investigations. Teaches the importance of dentition in determining an age estimate of human remains. Identifies the differences among the sexes, whether the remains are human or nonhuman, and what is of forensic significance. Explains crime scene methodology and clinical applications in Forensic Anthropology. Teaches problem solving and analytical thinking in order to develop a biological profile based on population-specific data and standards. Investigates different pathological conditions and variables which must be taken into consideration when determining the cause of death.

ZOOL 3700 (Cross-listed with: EXSC 3700)
Exercise Physiology
3:3:0 Fall, Spring, Summer
* Prerequisite(s): EXSC Majors: ZOOL 2320 or 232H, ZOOL 2325 or 232L, and EXSC 270G all with a C- or higher and (MATH 1050 or MATH 1055). PETE Majors: PETE 2700 and ZOOL 1090 with a C- or higher and (MATH 1050 or MATH 1055). All: University Advanced Standing
* Prerequisite(s) or Corequisite(s): ZOOL 2320 and ZOOL 2325, University Advanced Standing
* Corequisite(s): ZOOL 2420 or 242H, ZOOL 2425 or 242L
Studies acute and chronic physiological responses to exercise, as well as nutritional and environmental effects on these responses. Requires separate weekly laboratory. Canvas Course Mats $78/McGraw applies.

ZOOL 3705 (Cross-listed with: EXSC 3705)
Exercise Physiology Laboratory
1:0:3 Fall, Spring, Summer
* Prerequisite(s): University Advanced Standing
* Corequisite(s): EXSC 3700
Studies acute and chronic physiological responses to exercise, as well as nutritional and environmental effects on these responses. The laboratory is designed to offer the hands-on experience where students will experience the physiological responses to different stressors in the lab setting. The labs are arranged to be conducted as similar material is being discussed in class. Course Lab fee of $28 for materials applies.
ZOOL 4000
Animal Behavior
3:3:0 Spring
* Prerequisite(s): BIOL 1620 and University Advanced Standing
Examines the biological basis of animal behavior with emphasis on the underlying mechanisms and evolutionary causes of behavior. Covers first the proximate causes of behavior and then the ultimate or evolutionary causes of behavior. Includes topics such as the genetic basis of behavior, perceptual and effectual systems, ethology, neurophysiology, learning, animal communication, sexual behavior, and social systems.

ZOOL 4100 (Cross-listed with: MICR 4100)
Parasitology
4:3:3 On Sufficient Demand
* Prerequisite(s): (BIOL 1620 or MICR 2060) with a C- or higher and University Advanced Standing
Introduces the study of parasites. Emphasizes the biology of principal groups of parasites affecting humans, livestock, and other animals, including their medical economic, and ecological significance. Emphasizes parasites causing zoonotic diseases. Includes weekly laboratory experience involving identification of parasites. Course Lab fee of $25 applies.

ZOOL 4300
Histology
4:3:2 Spring
* Prerequisite(s): [(ZOOL 2320 or ZOOL 232H) with a C- or higher or written instructor approval] and University Advanced Standing
For pre-professional students pursuing biomedical careers and Biology majors with a particular interest in vertebrate structure and function. Studies the microscopic structure of the body at the cellular, tissue, and organ levels. Emphasizes physical and functional relationships of various tissues in the organs of the body. Includes weekly laboratory. Course Lab fee of $35 applies.

ZOOL 4400
Pathophysiology
4:4:0 Fall, Spring
* Prerequisite(s): ZOOL 2320, ZOOL 2420, and MICR 2060 each with a minimum grade C-, and University Advanced Standing
For Biology majors with an emphasis in human physiology, pre-professional majors, and nursing students. Studies pathophysiological etiologies and mechanisms that cause disease and examines physiological adaptations and dysfunction of organs and organ systems in a disease state.

ZOOL 4500
Comparative Vertebrate Zoology
3:3:0 On Sufficient Demand
* Prerequisite(s): ZOOL 3100 and (ZOOL 1090 or ZOOL 2320), with a grade of C- or higher, and University Advanced Standing
* Corequisite(s): ZOOL 4505 Comparative Vertebrate Zoology Laboratory
Studies the structure and function of vertebrates at the cellular, tissue, organ and systems levels. Emphasizes developmental and evolutionary comparative aspects of mammalian, avian, reptilian, amphibian, and piscian organs and systems.

ZOOL 4505
Comparative Vertebrate Zoology Laboratory
1:0:3 On Sufficient Demand
* Prerequisite(s): ZOOL 3100 and (ZOOL 1090 or ZOOL 2320), with a grade of C- or higher, and University Advanced Standing
* Corequisite(s): ZOOL 4500 Comparative Vertebrate Zoology
Studies the structure and function of vertebrates at the cellular, tissue, organ and systems levels. Emphasizes developmental and evolutionary comparative aspects of mammalian, avian, reptilian, amphibian, and piscian organs and systems. Course Lab fee of $24 applies.

ZOOL 4600
Ornithology
4:3:2 Fall
* Prerequisite(s): BIOL 1620 and University Advanced Standing; ZOOL 3100 and ZOOL 3105 highly recommended
Provides an in-depth study of avian evolution, systematics, developmental anatomy (wings, beaks, feathers), physiology, and social and reproductive behavior. Emphasizes an evolutionary and adaptive theme to the study of birds. Includes lectures, laboratories and field trips. Course Lab fee of $41 for transportation, lab applies.

ZOOL 4700
Advanced Anatomy
4:3:3 Fall, Spring
* Prerequisite(s): ZOOL 2320 with a minimum grade of C- and University Advanced Standing
For students interested in biomedical science careers or with a special interest in anatomy. Covers principles and techniques of anatomical investigation and specimen preparation. Provides supervised experience in human cadaver dissection, anatomic interpretation of radiographs, craniometrics, and palpation of the body. A regional dissection approach will be used in the lab. Requires problem solving and analytical thinking. Includes the theory and basic principles of various forms of diagnostic imaging, light and electron microscopy, skeletal preparation, and injection/maceration techniques. Includes weekly laboratory. Course Lab fee of $13 applies.

ZOOL 4750
Human Physiology A Cell Biology Approach
4:3:3 Not Offered
* Prerequisite(s): BIOL 3400 and University Advanced Standing
Addresses physiological principles and functions of the human body systems at the molecular level. Emphasizes cell signal transduction involved in the body maintaining homeostasis. Gives special attention to nervous, muscular, cardiovascular, urinary and respiratory systems. Requires problem solving and analytical thinking skills to be successful in the class. Includes weekly laboratory. Course Lab fee of $25 applies.

ZOOL 4780
Neuroscience
4:3:2 Fall
* Prerequisite(s): ZOOL 2420 with a C- or higher and University Advanced Standing
Covers aspects of molecular and cell biology, physiology, pharmacology, anatomy and the interplay of these and other disciplines in our understanding of the structure and function of the nervous system. Discusses neuroanatomy, developmental neurobiology, electrophysiology, membrane specializations related to signal propagation and signal transmission, neurotransmitter function and neuropharmacology, structure and function of simple neuronal circuits and complex neural networks and the plasticity of the nervous system. Incorporates discussion of journal articles related to the latest advances in neuroscience.

ZOOL 490R
Special Topics in Zoology
1 to 4:1 to 4:1 to 8 On Sufficient Demand
* Prerequisite(s): BIOL 1620 and University Advanced Standing
Explores and examines special topics relating to the field of zoology. Emphasizes areas of rapid growth in zoology or current importance to society. May be repeated for a total of 9 credits toward graduation.