

## Biological Engineering - Advanced Biology/Applied Science Electives

Department	Course	Course Title	Hours	Course Description
ANIMSCI	2200.01	Introductory to Animal Sciences	3	A study of the basic principles of genetics, breeding, reproduction, nutrition, behavior, and biotechnology as it applies to the molecular, cellular, and physical underpinnings of domesticated animal form and function. Prereq: Not open to students with credit for 2300H.
ANIMSCI	2200.02	Introductory to Animal Sciences Laboratory	1	Laboratory experience associated with basic principles of genetics, breeding, reproduction, nutrition, behavior, and biotechnology as it applies to the molecular, cellular, and physical underpinnings of domesticated animal form and function. Prereq or concur: 2200.01 or 2300H, or permission of instructor.
ANIMSCI	3130	Principles of Animal Nutrition	3	A study of nutrients needed by animals. Prereq: 2200.01, 2300H, Biology 1113, or 1113H, and Soph standing or above; or permission of instructor.
BIOCHEM	4511	Introduction to Biological Chemistry	4	An introductory course in biochemistry dealing with the molecular basis of structure, metabolism, genetic replication, transcription, and translation in plants, animals, and microorganisms. Prereq: Chem 1220 or 1250, and 2510 or 2310, and one semester of Biological Sciences; or permission of instructor.
BME	2800	Anatomy for Engineers	3	This course investigates the basic anatomical structure and physiological function of the human body with a biomechanical emphasis. Prereq: Enrollment in Biomedical Engineering pre-major or major; or permission of instructor.
ENTMLGY	4000	General Entomology Lecture	3	The course serves both as a single, concise exposure to the subject and as a foundation for advanced work in entomology (systematics, evolution, ecology, management). Lectures cover all fundamental aspects but emphasize basic biological phenomena, including diversity, evolution, classification, structure, function, development, reproduction, behavior, and ecology. Prereq: Biology 1113, 1113H, 1114, or 1114H
EEOB	2510	Human Anatomy	3	An introduction to human anatomy; small mammal dissection. Prereq: 3 sem cr hrs in Biological Sciences.
EEOB	2520	Human Physiology	3	A survey of the human nervous system, sense organs, muscle function, circulation, respiration, digestion, metabolism, kidney function, and reproduction. Prereq: 3 sem cr hrs in Biological Sciences.
EEOB	3310	Evolution	3	Basic conceptual issues and processes in evolution with an emphasis on the ecological basis of adaptation and consequences of natural selection. Also available summer term at Stone Lab. Prereq: Biology 1114 or 1114H, or permission of instructor.

EEOB	3510	Cellular and Developmental Biology	3	Introduction to the structure and function of animal cells, and to patterns of early development in vertebrates and invertebrates. Prereq: 3310, and Biology 1113 or 1113H.
EEOB	4550	Neurobiology of Behavior	3	Integration of studies of sensory, integrative and motor systems with evolution and ecology. Prereq: 2 courses in Biological Sciences.
FABENG	5520	Phytotechnology and Phytoremediation	3	Engineering principles of using plants for remediation of contaminated sites and treating polluted soil and water. Traditional methods as well as new trends and current research in phytoremediation technologies will be presented. Can be used as either a technical elective or an advanced biology/applied science elective. Prereq: 3500 or EnvEng 3200, or permission of instructor.
HCS	2200	The World of Plants	3	Study of the cultivation, environmental, genetic, and social/cultural factors which influence the sustainable production of plants for food, fiber, ornamental and recreational uses. Prereq: None.
HCS	2201	Ecology of Managed Plant Systems	3	Origin, diversification, and biogeography of plants inhabiting managed landscapes. Prereq: None.
HCS	2202	Form and Function in Cultivated Plants	4	An introduction to plant growth and development with special emphasis on structure function relationships important to productivity and quality in cultivated plants. Prereq: None.
HUMNTR	2310	Fundamentals of Nutrition	3	Nutrient and energy needs of the human biological system throughout the life cycle including energy balance with consideration of socio-psychological factors. Prereq: Biology 1113, or 1101, or equiv; and Chem 1210, or 1610, or 1910H; and Chem 1220, or 1620, or 1920H, or 1250.
INTSTDS	4550	Bioterrorism: An Overview	3	A broad awareness course on the bioterrorism threat to our food supply, crops, animals and public health, and bioterrorist organizations. Prereq: Jr or Sr standing.
MOLGEN	4500	General Genetics	3	The principles of genetics, including molecular genetics, transmission genetics of prokaryotes and eukaryotes, developmental and non-chromosomal genetics, recombinant DNA and genomics, and the genetics and evolution of populations. Prereq: Biology 1101, 1113, or 1113H, and 3 additional sem cr hrs in Biological Sciences.
MOLGEN	5601	Eukaryotic Molecular Genetics Laboratory	3-4	Current laboratory techniques used in the genetic, cellular, and molecular analyses of yeast, Drosophila, and other model systems. Prereq: 4500 or 4606, and Biochem 4511 or equiv, or permission of instructor.
MOLGEN	5607	Cell Biology	3	Analysis of the structure and function of animal and plant cells and their components, stressing molecular genetic and biochemical approaches. Prereq: 4500, 4500E, or 4606.

MOLGEN	5608	Genes and Development	3	Analysis of animal and plant development using modern genetic approaches. Prereq: 4500, 4500E, or 4606.
NEUROSC	3000	Cellular and Molecular Neuroscience	3	Course covering cellular and molecular organization of the nervous system. Prereq: Biology 1113 or 1113H, or permission of instructor.
NEUROSC	3010	Introduction to Neurophysiology	3	The course will discuss basic principles of neurophysiology working from the level of the ion channel to the whole system. Prereq: 3000 or 3050, or permission of instructor.
NEUROSC	3050	Structure and Function of the Nervous System	3	Basic principles of the anatomical and neurophysiological organization of the nervous system. Prereq: 3000.
PHYSIO	3101	Human Physiology I	3	First of a two-semester sequence. In this course the following areas of physiology are covered: cell membrane, neurophysiology, muscle and gastrointestinal physiology. Prereq: Two semesters of Chem.
PLNTPH	3001	General Plant Pathology Lecture	3	An introduction to plant diseases caused by fungi, bacteria, viruses, nematodes and parasitic higher plants. Video-linked to Wooster. Prereq: Biology 1101, 1113, 1115H, or Entmlgy 1101.