

College of Medicine, Florida State University

Biomedical Sciences Degree Program | IMS Division



List of Upper Division Science Electives

Revised on 10/7/2026

Course #	Name	Credits	Description	Prerequisites	Department	University Requirements	Misc Information
ANT 2511	Introduction to Biological Anthropology	3	Human evolution and variation with emphasis on principles of evolution, primate biology, fossil records, variability in living populations, and the biological functions of human culture capacities.		Anthropology	Natural Science	Typically Offered Fsll, Spring Summer
ANT 4462	Introduction to Medical Anthropology	3	This course is an investigation of different medical systems and their practitioners, the ecology of health, illness, human adaptation, nutrition, and the life cycle.		Anthropology		
ANT 4468	Bones, Bodies, & Disease	3	This course introduces students to Paleopathology. The course shows how the latest scientific and archaeological techniques can be used to identify the common illnesses and injuries that humans suffered in antiquity. In order to give a vivid picture of ancient disease and trauma, results of the latest scientific research that incorporate information gathered from documents are presented. This comprehensive approach to the subject throws fresh light on the health of our ancestors and on the conditions in which they lived, and it gives students an intriguing insight into the ways in which they coped with the pain and discomfort of their existence.	ANT2511	Anthropology	Before Fall 2025: Natural Science	
ANT 4525	Human Osteology	3	This course is designed to acquaint the student with each of the bones of the normal adult human skeleton. It is particularly appropriate for those students interested in archaeology and physical anthropology. Each bone is examined, followed by a review of abnormal variations. The uses of anthropometric instruments are demonstrated as are the methods of estimating age, sex, and racial origin.	ANT 2511 or instructor permission	Anthropology	SIP	Typically offered Fall and Spring

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BCH 4054	General Biochemistry II	3	Topics include quantitative analysis of assembly and mechanisms of molecular machines involved in metabolic and information transfer processes, how proteins bind proteins, nucleic acids, and ligands, as well as the methods for characterizing structures and interactions.	BCH4053 with a C- or better (prereq is CHM2211 C- or better)	Chemistry		Typically offered Spring
BMS 2913	Current Research in Biomedical Sciences	1	This course explores the most current and innovative topics in biomedical sciences. Students will gain insight into the mission, values, key concepts, and impact of biomedical research. Students will learn how to critically read and evaluate primary research literature and understand the recent advances and foundational knowledge in diverse biomedical fields.		Medical School		Typically offered Spring
BMS 4007	Introduction to Molecular Medicine	4	While Introduction to Molecular Medicine is predominated by a lecture-based teaching format, this course is focused in active-learning and problem-solving exercises representing the application phase of molecular medicine. Site-visits to health facilities will also be included in this course's structure.	BSC2011/L and CHM1046/L			Offered through FSU's International Program's Health Sciences Study Abroad location in Valencia, Spain.
BMS 4401	Principles of Pharmacology & Toxicology	3	This course introduces students to the basic principles of pharmacology and toxicology. Students will develop an understanding of pharmacokinetics, pharmacodynamics, and pharmacogenomics. Students will also learn the different mechanisms of toxicity, how to monitor and assess risk of exposures, and how these exposures promote disease. Students will learn how both pharmacology and toxicology contribute to drug discovery and development.	BSC2011/L and CHM1046/L	Medical School		Typically offered every other Spring. Previously offered under BMS4932 Special Topics "Pharmacology & Toxicology".

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BMS 4901*	Biomedical Research	varies 1- 3	This directed individual study course in biomedical sciences offers a unique opportunity for undergraduate students to perform research in the biomedical science laboratories in the College of Medicine. Students perform special supervised study or research in the area of the faculty member's research. An oral presentation and a final report of the research in the format of a short scientific publication is required.	Instructor permission. Coreq: Combined GPA of 3.0 in biology, chemistry, and physics coursework.	Medical School		Approval required in order to credit toward IMS Elective Requirements.
BMS 4932*	Immunology, Infection & Cancer/Human Immunology	3	This course provides knowledge and skill development in immunology research, including analyzing and understanding primary literature.	PCB3063 OR BCH4053 OR PCB4024	Medical School		Typically offered Fall
BMS 4932*	Principles of Animal Experimentation	3	An overview of animal care and use, this is designed for undergraduate and graduate students engaged in animal based research or that anticipate work with live animals. Topics covered include regulatory framework for animal research; animal facility operations; biology, husbandry, and care of common laboratory animal species; and experimental manipulation of laboratory animals. Emphasis is placed on practical experience with live animals.	BSC 2011, CHM 1046, and PCB 3063; or instructor permission	Medical School		Typically offered Fall
BMS 4932*	Research in Biomedical Science	1	This course is designed for undergraduate students who are pursuing experience in biomedical research. The focus of this course will be the introduction of the current research topics in the laboratories at Department of Biomedical Sciences, College of Medicine at FSU.	BSC2011 and CHM1046	Medical School		Typically offered Fall Taught under BMS 2913 effective Spring 2027.
BSC 2085	Anatomy and Physiology I	3	This course is the first of a two-semester human anatomy/physiology sequence emphasizing the cell, stimulus-response concept, and the skeletal-muscular and first half of the nervous systems.		Biological Sci	Natural Science	Typically offered Fall

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BSC 2085L	Anatomy and Physiology I Lab	1	This course is the first of a two-semester human anatomy/physiology sequence emphasizing the cell, stimulus-response concept, and the skeletal-muscular and first half of the nervous systems.	Coreq: BSC2085	Biological Sci	Natural Science	Typically offered Fall
BSC 2086	Anatomy and Physiology II	3	This course is a continuation of a two-semester human anatomy/physiology sequence beginning with the second half of the nervous system, then continuing with endocrine, cardiovascular, respiratory, digestive, excretory, and reproductive systems. Also included are fluid-electrolyte balance and immunity.	BSC2085 or Instructor's permission	Biological Sci		Typically offered Spring
BSC 2086L	Anatomy and Physiology II Lab	1	This lab focuses on sensory and organ systems found in the human body. Physiology of the sensory and organ systems are explored with lab activities and computer simulated experiments.	Coreq: BSC2086	Biological Sci		Typically offered Spring
BSC 4933r*	Virology	3	Selected Topics in Biological Science. May be repeated up to a maximum of eight semester hours.	BSC2011/L and CHM1046/L; Junior or Senior standing	Biological Sci		Must be taken under topic listed in order to count toward IMS Degree elective requirement
CHM 4130	Advanced Analytical Chemistry	3	This course covers data analysis, laboratory computers, atomic and molecular optical spectroscopy, nuclear-magnetic resonance spectroscopy, chromatography and electrophoresis, electrochemistry, and mass spectrometry.	Prereq: CHM 3120/L (prereq CHM1046/L), & PHY 2048C (prereq MAC2311), or PHY 2053C (prereqs MAC1114 & MAC1140). Coreq: CHM 4410	Chemistry		

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CHM 4130L	Advanced Analytical Chemistry Lab	1	This course is the laboratory portion of CHM 4130, Advanced Analytical Chemistry. Experiments include: signal enhancement by filtering and ensemble averaging, flame spectroscopy determination of Li and Mg, spectrofluometric determination of quinine, UV-visible spectroscopy, high-performance liquid chromatography (HPLC) simulations, Raman spectroscopy, solvent extraction and gas chromatography, as well as HPLC determination of analgesics.	Coreq: CHM4130 (recommended before CHM 4130L.)	Chemistry		
CHM 4610	Inorganic Chemistry	3	This course explores physical principles, systematics in the chemistry of periodic groups, descriptive chemistry of the inorganic elements. Topics include atomic structure and the periodic classification of the elements, chemical bonding and reactivity, acid-base chemistry, chemistry of main group elements, and coordination chemistry of the transitional metal elements.	Prereq: CHM 2211/L Coreq: CHM 4410 or instructor permission	Chemistry		Typically offered Fall
CHM 4610L	Inorganic Chemistry Lab	1	This lab covers synthesis and characterization of inorganic compounds.	Coreq: CHM 4610 (prereqs: CHM2211 and CHM2211L)	Chemistry		Typically offered Spring
HSC 3161	Genetics for Health Sciences	3	This course introduces the principles of human genetics focusing on its application to health sciences and medical practice. Students will explore the molecular basis of inheritance, gene function, and variation in human populations. Through lectures, case studies, and discussions on ethical issues, students will learn how genetic knowledge is used to understand, diagnose, and treat human disease. The course analyzes genetics and genomic technologies relevant to modern healthcare.	BSC 2011/L	Health Sciences Interdisciplinary		This course does not meet the prerequisite requirements for MCB 4403, PCB 4024, PCB 4233/L, PCB 4253/L, or PCB 4701.

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HUN 3224	Metabolism I	3	This course emphasizes the physiochemical role of carbohydrates, lipids, and proteins in metabolic pathways; their integration and regulation; bases for determining requirements for energy- yielding nutrients and energy and dietary standards; cell growth and body composition.	HUN 1201 and CHM2210	Nutrition and Integrative Physiology		Typically offered Fall and Spring
IHS 4120	Frontiers in Medicine	3	This course aims to provide advanced undergraduate students the opportunity to gain an understanding of common human disease conditions through a highly interactive set of learning activities. We recommend that students have taken physiology, genetics and biochemistry. Examples of topics covered include heart failure, cancer, diabetes, depression and Alzheimer's disease.		Health Sciences Interdisciplinary		Typically offered Spring
MCB 4403	Prokaryotic Biology	3	This course covers structural and functional characteristics of microorganisms, with emphasis on prokaryotes (bacteria and archaea) and viruses. Topics include: prokaryotic cell structure and function, physiology and genetics of prokaryotes and viruses, physiological and molecular aspects of microorganisms and human disease, and biotechnological applications of microbial physiology (environmental, food, and industrial microbiology).	Prereq: BSC 2011/L CHM 2210, PCB 3063 Coreq: MCB 4403L	Biological Sci		
MCB 4403L	Prokaryotic Biology Lab	2	This course covers laboratory methods for growth, handling, and study of prokaryotes and other types of microorganisms. Topics include: aseptic technique and isolation of pure cultures; microscopic methods; effects of environment on growth; viruses; physiological characterization methods; and methods related to medical, environmental, and food microbiology.	BSC 2011/L and CHM 1046/L	Biological Sci		
PCB 3063	General Genetics	3	This course is an introduction to the principles of transmission and molecular genetics of prokaryotes and eukaryotes and significance of these principles to other aspects of biological science.	BSC 2011/L and CHM 1046/L	Biological Sci		

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PCB 3134	Cell Structure and Function	3	This course focuses on topics such as: cellular chemistry and physiology, morphology, and function of cellular organelles; and cellular motility, growth, division, communication, and regulation.	BSC 2011/L and CHM 1046/L	Biological Sci		
PCB 3743	Vertebrate Physiology	3	This course studies physiological systems of vertebrates with emphasis on mammals. Mechanisms underlying physiological processes and the physico-chemical principles upon which they depend are also studied.	BSC 2011/L and CHM 1046/L	Biological Sci		
PCB 4024	Molecular Biology	3	This course studies the molecular basis of cellular function with emphasis on the activities of DNA, RNA, and the regulation of gene expression.	Prereq: BSC 2011/L, CHM 1046/L; Recommended: PCB 3063 and PCB 3134	Biological Sci		Typically offered Fall and Spring
PCB 4233	Immunology	3	This course analyzes the tissues, cells, and molecules of the immune system and their relationships to disease and transplantation.	BSC 2011/L, CHM 1046/L; also CHM 2210, PCB 3063, PCB 3134, or instructor permission.	Biological Sci		Typically offered Fall and Spring
PCB 4233L	Immunology Lab	1	This course analyzes the tissues, cells, and molecules of the immune system and their relationships to disease and transplantation.	Prereq: BSC 2011/L, CHM 1046/L; also CHM 2210, PCB 3063, PCB 3134. Coreq: PCB 4233	Biological Sci		Typically offered Spring
PCB 4253	Developmental Biology	3	This course discusses a number of topics, including fertilization, early embryonic events, organogenesis, differentiation, morphogenesis, cytoplasmic localization, determination, and differential gene expression.	BSC 2011/L, CHM 1046/L, PCB 3063,	Biological Sci		Typically offered Fall and Spring
PCB 4253L	Developmental Biology Lab	3	This lab combines lecture and laboratory experiments regarding sea urchin fertilization, frog and chick early development, gene expression, cell-cell interactions, and metamorphosis.	Prereq: BSC 2011/L, CHM 1046/L, PCB 3063 Coreq: PCB 4253	Biological Sci		Typically offered Spring

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PCB 4701	Human Physiology	3	This course covers the human nervous system, special sensory organ systems, the central nervous system, the muscle and skeletal systems, the heart and circulatory system, the respiratory system, the urinary and digestive systems, the endocrine system, and reproduction. Cellular mechanisms underlying the homeostatic regulation of each organ system are studied in the context of clinical impacts based upon diseases. For example, Muscular Dystrophy, diabetes mellitus, cardiac arrhythmias, cardiovascular disease, renal failure, pulmonary disease, Alzheimer's, Parkinson's, metabolic disorders, or infertility.	Prereqs: BSC 2011L, CHM1046/L; Pre/coreqs: PCB 3063 or PCB 3134	Biological Sci		
PET 3322	Functional Anatomy and Physiology I	3	The first part of a two-semester sequence, this course covers the functional anatomy and physiology of the skeletal, muscular, cardiovascular, respiratory, digestive, urinary, and endocrine systems, as well as part of the nervous system.	Prereq: CHM 1045 & HUN 1201. Coreq: PET 3322L	Nutrition and Integrative Physiology		
PET 3322L	Functional Anatomy and Physiology I Lab	1	The first part of a two-semester sequence, this lab covers the functional anatomy and physiology of the skeletal, muscular, cardiovascular, respiratory, digestive, urinary, and endocrine systems, as well as part of the nervous system.	Prereq: CHM 1045 & HUN 1201. Coreq: PET 3322	Nutrition and Integrative Physiology		
PET 3323C	Functional Anatomy and Physiology II and Lab	4	This course is a continuation of a two semester sequence of functional anatomy and physiology which includes the integumentary, nervous, lymphatic, immune and reproductive systems.	PET 3322	Nutrition and Integrative Physiology		

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PET 4076	Physical Dimensions of Aging	4	This course deals with the quality of life and individual differences as we age; physical decline of physiological systems (cardiovascular, muscular, joints, bone, neuromuscular); health, exercise, and well-being; and the pathology of aging. Assists students in developing an understanding of the physical aspects of aging to apply to setting such as physical therapy, sports medicine, and health and fitness programs in hospitals and retirement communities.		Nutrition and Integrative Physiology		Typically offered Spring
PHZ 4702	Biomedical Physics I	3	This course is the first in a series of two introductory courses on the applications of physics in biology and medicine. The course discusses applications of classical mechanics, hydrodynamics, and thermodynamics to motion, to the structure of the musculoskeletal, respiratory, and circulatory systems, as well as to the biology of the cell. The course is intended for students preparing for graduate studies in the biological sciences, for medical school, or for medical professions such as physical therapy and nursing.	PHY 2053C & 2054C or PHY 2048C & 2049C	Physics		Typically offered Fall
PHZ 4703	Biomedical Physics II	3	This course is the second in a series of two introductory courses on the applications of electricity, magnetism, optics, and modern physics to the nervous system, to vision, to modern topics in biomolecular research, as well as to microscopy and to modern biomedical imaging techniques. The course is intended for students preparing for graduate studies in the biological sciences, for medical school, or for medical professions such as physical therapy and nursing.	PHY 2053C & 2054C or PHY 2048C & 2049C	Physics		Typically offered Spring

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PSB 2000	Introduction to Neuroscience (formerly Brain and Behavior)	3	This survey course introduces students to the fundamental structure and function of the nervous system, neural mechanisms that underlie physiological phenomena, and the effect of experiences on neural function. Emphasis is placed on how the scientific method is employed across the many disciplines within neuroscience. This introductory course is appropriate for students from all majors.		Psychology	Natural Science	
ZOO 3713C	Comparative Vertebrate Anatomy	4	This course emphasizes form and function and origin and evolution of structure.	BSC 2011/L, CHM 1046/L	Biological Sci		Typically offered Spring
ZOO 4753C	Histology	4	This course explores the microscopic anatomy and functions of the cells, tissues, and glands composing the organs and systems of humans.	PCB 3134 (prereqs are BSC 2011/L and CHM 1046/L)	Biological Sci		Typically offered Fall

*Purple highlight = special topics course, **must** be taken under topic listed in order to count toward IMS Degree elective requirement