BIOMEDICAL SCIENCES (BMS)

BMS 117. The Human Organism. 3 Credits.
This course, designed for nonscience majors, emphasizes the human organism from a basic biological and developmental perspective. These concepts are explored by examining the development of the total human organism beginning with conception and onward into old age and eventual death. This course must be taken in conjunction with BMS 117L, the laboratory component of this course.
Corequisites: Take BMS 117L.
Offered: Every year, Fall and Spring
UC: Natural Sciences

BMS 117L. The Human Organism Lab. 1 Credit.
This lab, which accompanies BMS 117, The Human Organism, includes exercises/experiments designed to reinforce basic biological principles, which form the basis for understanding the biology of all organisms, including the human organism. This course must be taken in conjunction with BMS 117 lecture.
Corequisites: Take BMS 117.
Offered: Every year, Fall and Spring
UC: Natural Sciences

BMS 162. Human Health and Disease. 3 Credits.
This course, which is designed for nonscience majors, describes human disease from a biological viewpoint, and presents human health concerns and issues for discussion. Historical and sociological perspectives on human disease as well as the scientific investigation of disease processes are included. The role of molecular biology and biotechnology in approaching human disease is discussed.
Prerequisites: None
Offered: Every year, Fall and Spring
UC: Natural Sciences

BMS 200. Biomedical Basis and Experience of Human Aging. 3 Credits.
Key concepts of this course include: 1) the natural decline in human capabilities and function; 2) significant elder diseases; 3) elder health care issues; 4) factors that affect aging rates; and 5) death and dying. The course begins with concepts including research techniques, cellular aging and demographics. The second half focuses on the organ systems significantly affected in aging including skin, bones, muscle, the senses, the cardiovascular system and the nervous system.
Prerequisites: Take 1 group; BIO 101, BIO 102 or BIO 150, BIO 151 or BMS 117, BMS 162.
Offered: Every year, Fall and Spring
UC: Natural Sciences, Intercultural Understand

BMS 213. Microbiology and Pathology. 3 Credits.
This introductory overview of microorganisms presents a detailed study of the interactions of pathogenic microbes and humans, particularly as they apply to a clinical setting; this course is designed primarily for the health practitioner. This course must be taken in conjunction with BMS 213L. Students may receive credit for BMS 213 or BMS 370, but not both.
Prerequisites: Take BIO 101, BIO 102 or BIO 103, BIO 104 or BIO 150, BIO 151.
Corequisites: Take BMS 213L.
Offered: Every year, Fall and Spring

BMS 213L. Microbiology and Pathology Lab. 1 Credit.
This lab, which accompanies BMS 213 Microbiology and Pathology, includes exercises/experiments designed to cultivate basic microbiological techniques and reinforce important principles of general and clinical microbiology. This course must be taken in conjunction with BMS 213.
Corequisites: Take BMS 213.
Offered: Every year, Fall and Spring

BMS 221. Physiology and Effects of Obesity in Society. 3 Credits.
This course examines the physiology and effects of adult and childhood obesity, its development, prevention and treatment. The course also explores the impacts and consequences obesity has on the individual and society (both in the U.S. and globally).
Prerequisites: None
Offered: Every year, Fall
UC: Breadth Elective

BMS 276. Drug Development. 3 Credits.
In this course, students study the processes required to develop new drugs, as well as the regulations associated with drug development. Topics include drug discovery, preclinical and clinical testing of drugs, pharmacoeconomics and legislation associated with drug development. Specific therapeutic drug examples are discussed throughout the course.
Prerequisites: Take 1 group; BIO 101, BIO 102 or BIO 150, BIO 151 or BMS 117, BMS 162 or BIO 105, BIO 106.
Offered: Every year, Fall and Spring

BMS 278. Research and Technology. 3 Credits.
This course provides a broad, discussion-based investigation of current scientific techniques including scientific writing, presentations, literature searches, as well as bioinformatics, protein and nucleic acid methodologies. Students learn the skills necessary to identify and understand the proper techniques for designing, implementing and evaluating scientific research. This interactive course helps prepare students for independent research projects at Quinnipiac University, graduate/professional programs and careers in the biological, biomedical or health sciences.
Prerequisites: Take BIO 150, BIO 150L.
Offered: Every year, Spring

BMS 299. Biomedical Sciences Journal Club. 1 Credit.
This course follows the structure of a traditional journal club. Each week, students present the background, content, and the scientific/social implications of a peer reviewed paper in the translational sciences to their peers. Students not presenting are expected to actively participate in a group discussion. This course focuses on advancing students' scientific knowledge and developing effective oral and written communication skills. This course may be repeated for up to 3 credits.
Prerequisites: Take BIO 102 or BIO 151.
Offered: Every year, Fall

BMS 300. The Physiology of Human Performance I. 3 Credits.
This course presents a detailed examination of muscle and nerve physiology, and central nervous system control of posture and locomotion. Bioenergetics and exercise metabolism are considered. Anatomical and physiological factors limiting various types of physical performance are discussed. Full-year course; must be taken in sequence. This course must be taken in conjunction with BMS 300L.
Prerequisites: Take BIO 212 and CHE 102, CHE 102L or CHE 111, CHE 111L.
Offered: Every year, Fall

BMS 300L. The Physiology of Human Performance I Lab. 1 Credit.
(3 lab hrs.) Laboratory exercises/experiments are designed to reinforce basic principles of physiology examined in lecture. This course must be taken in conjunction with BMS 300 lecture.
Corequisites: Take BMS 300.
Offered: Every year, Fall

BMS 301. Physiology of Human Performance II. 3 Credits.
This course presents a detailed examination of cardiorespiratory and thermoregulatory responses to exercise. Body composition and diet/nutrition are considered. Anatomical and physiological factors limiting various types of physical performance are discussed. Full-year course; must be taken in sequence. This course must be taken in association with BMS 301L.
Prerequisites: Take BMS 300, BMS 300L.
Corequisites: Take BMS 301L.
Offered: Every year, Spring

BMS 301L. Physiology of Human Performance II Lab. 1 Credit.
Lab to accompany BMS 301 (3 lab hrs.) Laboratory exercises/experiments are designed to reinforce basic principles of physiology examined in lecture. This course must be taken in association with BMS 301.
Prerequisites: Take BMS 300.
Corequisites: Take BMS 301.
Offered: Every year, Spring

BMS 304. Biological Chemistry. 3 Credits.
This course, which is designed for ELMPA & HSC majors, is a comprehensive study of contemporary biochemistry for pre-health students. The fundamental chemical and physical principles that underlie living processes are examined with an emphasis on the chemical structure and biological function. Medical and clinical perspectives relate the chemistry to health concerns and/or diagnostic applications. Students who have completed CHE 315 are not eligible to take this course. This course will not fulfill the requirements for the pre-medical studies designation.
Prerequisites: Take BIO 102, BIO 102L or BIO 151; and BIO 212, BIO 212L, CHE 111, CHE 210.
Offered: Every year, Fall and Spring

BMS 310. Neuroanatomy. 3 Credits.
This course offers students a detailed study of the fine and gross anatomy of the central nervous system. Major structures and landmarks within each major brain vesicle and spinal cord are discussed using clinical examples and neuroimaging.
Prerequisites: Take BIO 102, BIO 102L or BIO 151.
Offered: Every other year, Fall

BMS 318. Pathophysiology. 3 Credits.
This course takes a mechanistic approach to the regulation of function of organ systems to provide students with the underlying physiological concepts in the homeostasis of each system and its interrelationship to other systems, and the pertinent diseases that best exemplify the disarray of the controlling mechanism. Students learn a way of thinking that enables them to conceptualize clinical problems in relation to system functions.
Prerequisites: Take BIO 211, BIO 212
Offered: Every year, Fall and Spring

BMS 319. Public Health: Epidemiology of Infectious Diseases. 3 Credits.
This course provides an introduction to the application of epidemiological principles and practice to the study of infectious diseases. Students focus on the study of the frequency, distribution and determinants of infectious diseases of major public health importance. Emphasis also is placed on prevention methods and public health control efforts undertaken locally, nationally and internationally.
Prerequisites: Take BMS 213 or BMS 370.
Offered: Every year, Fall

BMS 320. Pharmacology. 3 Credits.
This course takes a physiological systems approach to the study of the major classes of drugs used in therapeutics. Each class of drugs is studied according to dose-response characteristics, mechanism of action, major physiological effects, toxicity and possible drug interaction.
Prerequisites: Take BIO 211, BIO 212.
Offered: Every year, Spring

BMS 325. Toxicology. 3 Credits.
Toxicology is the branch of science that investigates the complex interactions between exogenous chemicals and physical processes (e.g. radiation) with living organisms. This course entails an examination of the absorption, distribution, toxicokinetics, metabolism and elimination of exogenous substances from the body. Particular emphasis is placed on the effects of toxic agents on the following systems in humans: hepatobiliary, pulmonary, renal, nervous and reproductive. The role of toxic chemicals/physical agents in teratogenesis, mutagenesis and carcinogenesis also is studied.
Prerequisites: Take BIO 102, BIO 102L or BIO 151 and CHE 211.
Offered: Every year, Spring

BMS 330. Endocrinology. 3 Credits.
This course introduces students to 1) an intensive understanding of the mechanism of hormone action; 2) the importance of the interrelationship among all hormones; 3) a detailed clinical situation dealing with hormonal aberrations; and 4) a theoretical and practical method for hormone assays.
Prerequisites: Take BIO 102, BIO 102L or BIO 151.
Offered: Every year, Fall

BMS 332. Histology and Lab. 4 Credits.
This course is intended for senior ELMPA students. It entails the microscopic and ultra-microscopic study of the structure of cells, tissues and organs, and emphasizes their functional mechanisms. Students learn how to prepare and stain normal tissue slides for histological and histochemical study, and how to examine these prepared slides.
Prerequisites: Take BIO 211, BIO 212, CHE 210, CHE 211.
Offered: Every year, Spring

BMS 364. Molecular Mechanisms of Cancer Therapies. 3 Credits.
This course examines the cellular biology of cancer and the molecular mechanisms of cancer therapies. Students discuss both traditional and current treatment options, as well as future areas of cancer research and medicine. Students compare the use of generalized cancer therapies, tumor-targeted therapies, and upcoming therapies and their effect on patient prognosis.
Prerequisites: Take BIO 102, BIO 102L or BIO 151, BIO 151L, and CHE 102, CHE 102L or CHE 111, CHE 111L.
Offered: Every other year, Spring

BMS 370. General Microbiology. 3 Credits.
This study of the biology of bacteria and other microorganisms includes the structural features, genetics, biochemistry, ecology and symbiotic relationships of microbes, with particular emphasis on the differences between unicellular microbes and multicellular organisms. Students may receive credit for BMS 370 or BMS 213, but not both. This course must be taken in conjunction with BMS 370L.
Prerequisites: Take BIO 101, BIO 102 or BIO 150, BIO 151; and CHE 110, CHE 111.
Offered: Every year, Fall and Spring

BMS 370L. General Microbiology Lab. 1 Credit.
In the laboratory component of General Microbiology, students master foundational microbiological techniques such as microscopy, staining and culture of microbes, and utilize these techniques to explore various properties of microbes relevant to clinical, industrial, environmental and household settings. Students also identify unknown bacteria using both biochemical assays and molecular techniques. Critical thinking is emphasized through a project-based inquiry approach. This course must be taken in conjunction with BMS 370.
Corequisites: Take BMS 370.
Offered: Every year, Fall and Spring

BMS 372. Pathogenic Microbiology. 3 Credits.
This course involves the study of medically important microbes. Topics include the principles of microbial pathogenesis, host-microbe interactions and etiology of infectious disease. This course must be taken in conjunction with BMS 372L.
Prerequisites: Take BMS 370, BMS 370L.
Corequisites: Take BMS 372L.
Offered: Every year, Spring

BMS 372L. Pathogenic Microbiology Lab. 1 Credit.
The laboratory component of Pathogenic Microbiology includes laboratory exercises/experiments designed to reinforce the biochemical, serological and pathogenic characteristics of disease-producing microorganisms. Special emphasis is placed on techniques used to identify disease-causing microorganisms and differentiating them from closely related members of human indigenous microflora. This course must be taken in conjunction with BMS 372.
Prerequisites: Take BMS 370, BMS 370L.
Corequisites: Take BMS 372.
Offered: Every year, Spring

BMS 373. Mycology. 3 Credits.
The morphology, taxonomy and phylogeny of fungi are studied in this course. The laboratory companion to this course (BMS 373L) provides opportunities for culturing and performing biochemical analyses of selected fungi, including human pathogens. This course must be taken in conjunction with BMS 373L.
Corequisites: Take BMS 373L.
Offered: As needed

BMS 373L. Mycology Lab. 1 Credit.
This lab accompanies BMS 373 Mycology and allows many opportunities for culturing and performing biochemical analyses of selected fungi, including human pathogens. This course must be taken in conjunction with BMS 373.
Corequisites: Take BMS 373.
Offered: As needed

BMS 375. Immunology. 3 Credits.
This course entails a study of the basic principles and regulatory mechanisms of the human immune response. Innate defenses along with cellular and humoral immune defense mechanisms are studied in detail. Abnormal immune system functions are explored via study of acquired and primary immunodeficiencies and autoimmune diseases. Vaccines and transplantation also are discussed. Students may receive credit for BMS 375 or HSC 375, but not both. Students withdrawing from either lecture or lab must withdraw from both. Prerequisite: BMS 370 (or BMS 213 with permission of the instructor); BMS majors must take BMS 375 and BMS 375L together.
Prerequisites: Take BMS 370, BMS 370L.
Corequisites: Take BMS 375L.
Offered: Every year, Fall

BMS 375L. Immunology Lab. 1 Credit.
The laboratory component of Immunology involves laboratory exercises/experiments designed to reinforce immunological concepts. Topics fundamental to both immunological research and clinical diagnostics are covered. Cellular-based and clinically relevant concepts are reinforced via hands-on immunological techniques, class discussions, presentations and case studies. Students withdrawing from either lecture or lab must withdraw from both. BMS majors must take BMS 375 and BMS 375L together.
Prerequisites: Take BMS 370, BMS 370L.
Corequisites: Take BMS 375.
Offered: Every year, Fall

BMS 378. Vaccines and Vaccine-Preventable Diseases. 3 Credits.
This course examines the current understanding of vaccinations, as well as the historical and current implication of vaccine-preventable diseases (VPDs). Students gain knowledge regarding VPDs and the childhood vaccination schedule. They gain an understanding of how vaccines work, why they are still necessary, and how to explain why they are safe. Emphasis is placed on the need to effectively communicate with the public regarding vaccine myths and misconceptions. Also included is a publicly disseminated "change the world" project. Students may only take one of the following for credit: BMS 378, HSC 378 or BMS 525.
Prerequisites: Take BMS 213, BMS 213L or BMS 370, BMS 370L.
Offered: Every year, Spring

BMS 397. Biomedical Sciences Internship. 1-4 Credits.
Students partake in a part-time professional work experience with a sponsoring organization. The experience brings together theory, application and current practice in the translational sciences. Journaling and discussion boards provide students with a reflective and intentional assessment of the field, their work and career development. Students must submit a paper describing their experimental aims, design and outcomes, and also present their findings as a seminar or poster.
Prerequisites: Minimum GPA of 3.0, Permission of Department Chair.
Offered: As needed

BMS 399. Independent Study. 1-6 Credits.
Prerequisites: None

BMS 470. Virology. 4 Credits.
This course covers the strategies employed by different virus families to infect host cells and replicate within them. This includes animal, plant and bacterial viruses. Topics include: viral structure, genetics, molecular mechanism of replication and host response to infection. Students also are exposed to standard research methodologies and cutting-edge research used in the field through reviews of current research articles.
Prerequisites: Take BMS 370, BMS 370L.
Offered: Every year, Fall

BMS 470L. Virology Lab. **0 Credits.**
Lab to accompany BMS 470. (4 lab hrs.)
Prerequisites: None
Offered: Every year, Fall

BMS 471. Human Gross Anatomy & Dissection. **4 Credits.**
This course is a regional-based approach to the study of human anatomy utilizing cadaver dissection, with an introduction to histology, embryology, neuroanatomy, and medical imaging. Through the combination of engaging lectures and immersive laboratory sessions, students will develop a profound understanding of the relationship between structural and its functional significance.
Prerequisites: Take BIO 102 or BIO 103 or BIO 151, or senior status
Offered: Every year, All

BMS 472. Biotechnology. **4 Credits.**
This laboratory course addresses the genetic manipulation and use of organisms (commonly genetically modified) in agriculture, transgenic animal formation and human gene therapy. Molecular diagnostics, gene cloning, and genetic analysis of single nucleotide polymorphisms (SNPs) and epigenetic markers are addressed with hands-on experiments. The course is designed for students interested in careers in medicine, or biomedical sciences and microbiology research and industry (4 lab hrs.).
Prerequisites: Take BMS 370, BMS 370L.
Offered: Every year, Spring

BMS 473. Infections of Leisure. **3 Credits.**
This course looks at infectious hazards associated with a wide range of human leisure activities, from lazing on a beach to relaxing in a spa, dining out, or simply staying home and gardening. Participants discuss infections linked to salt and freshwater activities, camping and the outdoors, gardening, contact with animals, eating, foreign travel, sports, sexually transmitted diseases, body piercing, tattooing and trekking to high altitudes. Topics such as epidemiology, antibiotic resistance, pathogenicity, plagues and vaccines also are addressed. This course has social organization of the science of infectious diseases.
Prerequisites: Take BMS 370, BMS 370L or BMS 213, BMS 213L.
Offered: Every year, Fall

BMS 474. Power of Plagues. **3 Credits.**
This course examines the impact of infectious diseases on humans--in the past, in the present and in the future. From the 14th-century plague to the current HIV/AIDS, diseases have fundamentally altered the shape of society, politics and culture. This class examines some important diseases, including their impact, pathogenicity, infectivity, epidemiology, consequences, costs and lessons learned. Diseases such as smallpox, polio, rabies, tuberculosis, cholera, bubonic plague, influenza, malaria, yellow fever, syphilis and AIDS are investigated. The impact of antibiotics, antibiotic resistance and nosocomial infections also is discussed.
Prerequisites: Take BMS 213, BMS 213L or BMS 370, BMS 370L.
Offered: Every year, Summer

BMS 475. Special Topics in Microbiology. **1-4 Credits.**
The latest developments and concepts in the field of clinical and public health microbiology are introduced. Topics may include the oral microbiology, epidemiology of Streptococcal and Staphylococcal infections, antibiotic resistance, drug susceptibility testing, the bacteriology of the hospital environment, vaccine-preventable diseases or quality control in the clinical microbiology laboratory. Recommendation of BMS 213/370 lab instructor and permission of instructor needed. One lecture hour, one research meeting hour, one discussion hour and 4-10 lab hours.
Prerequisites: Take BMS 370, BMS 370L or BMS 213, BMS 213L.
Offered: Every year, All

BMS 477. Critical Analysis and Reasoning In the Biomedical Sciences. **2 Credits.**
This course helps develop skills necessary for critical analysis and reasoning. This course covers inconsistencies, biases, and fallacies in reasoning and analysis vital for research/science/healthcare careers as well as MCAT and other exam preparation. Students: examine how they think while reading and discussing clinical & research literature, learn to analyze readings and data by examining and practicing logical reasoning, and build evaluations and analyzing readings to ask and answer questions and build testable hypotheses.
Prerequisites: Take BIO 151 or BIO 102 and instructor approval.
Offered: Every year, Spring

BMS 478. Microbiology Seminar. **1 Credit.**
This course introduces students to the microbiology- and immunology-related literature required for the development, implementation and analysis of an independent research project in microbiology and immunology. For microbiology majors.
Prerequisites: Take BMS 370, BMS 370L.
Offered: Every year, Fall

BMS 479. Microbiology Research. **2 Credits.**
Independent projects in selected areas of microbiology and biotechnology are completed under the direction of a faculty member. For microbiology majors.
Prerequisites: Take BMS 370, BMS 370L.
Offered: Every year, Fall and Spring

BMS 481. Research Techniques in Biomedical Sciences. **1-4 Credits.**
Laboratory course designed around learning the basic principles of a research technique in the context of a faculty member's research. Learn how the method works, gain technical proficiency leading to independence, and practice professional scientific communication through analysis and interpretation of original data. Students interested in implementing these techniques in subsequent independent research, or who want to build their resumes with laboratory skills, are welcome. May be taken more than once for different techniques.
Prerequisites: None
Offered: Every year, Fall and Spring

BMS 482. Independent Study in Microbiology. **1-4 Credits.**
This course consists of microbiology content not offered by another QU catalog course. It must involve contact hours and scholarly activities equivalent to any regularly offered course. This course often includes review of the scientific literature in the field of the research project and creating a "product," such as a term essay, a series of short papers, laboratory or project reports, a portfolio or presentation at a scientific meeting. Students cannot register online; registration is via a paper form only. BMS students may take up to 8 credits of BMS 482, BMS 483, BMS 498, BMS 499, HSC 498, HSC 499.
Prerequisites: None
Offered: Every year, Fall and Spring

BMS 483. Independent Study in Microbiology. **1-4 Credits.**
This course consists of microbiology content not offered by another QU catalog course. It must involve contact hours and scholarly activities equivalent to any regularly offered course. This course often includes review of the scientific literature in the field of the research project and creating a "product," such as a term essay, a series of short papers, laboratory or project reports, a portfolio or presentation at a scientific meeting. Students cannot register online; registration is via a paper form only. BMS students may take up to 8 credits of BMS 482, BMS 483, BMS 498, BMS 499, HSC 498, HSC 499.
Prerequisites: None
Offered: Every year, Fall and Spring

BMS 498. Independent Study in Biomedical Sciences I. 1-4 Credits.
This course consists of biomedical sciences content not offered by another QU catalog course. It must involve contact hours and scholarly activities equivalent to any regularly offered course. This course often includes review of the scientific literature in the field of the research project and creating a "product," such as a term essay, a series of short papers, laboratory or project reports, a portfolio or presentation at a scientific meeting. Students cannot register online; registration is via a paper form only. BMS students may take up to 8 credits of BMS 482, BMS 483, BMS 498, BMS 499, HSC 498, HSC 499.
Prerequisites: None
Offered: As needed

BMS 499. Independent Study in Biomedical Sciences II. 1-4 Credits.
This course consists of biomedical sciences content not offered by another QU catalog course. It must involve contact hours and scholarly activities equivalent to any regularly offered course. This course often includes review of the scientific literature in the field of the research project and creating a "product," such as a term essay, a series of short papers, laboratory or project reports, a portfolio or presentation at a scientific meeting. Students cannot register online; registration is via a paper form only. BMS students may take up to 8 credits of BMS 482, BMS 483, BMS 498, HSC 498, HSC 499.
Prerequisites: None
Offered: As needed