Biomedical Sciences

BMD 210L Microbiology in Healthcare Lab 1 cr
Laboratory experience includes introduction to fundamental microbial techniques, including differential staining, biochemical identification techniques, and antimicrobial susceptibility testing. Patient case studies will be used to supplement learning experience.
Pre-requisite: (BLY 101 Minimum Grade of C or BLY 121 Minimum Grade of C or CH 101 Minimum Grade of C or CH 131 Minimum Grade of C).

BMD 212L Intro to Food Science Lab 1 cr
Laboratory experience includes an introduction to digestion, absorption, transportation, and utilization of nutrients. Lab exercises are completed in which students prepare foods and observe the chemical and physical properties that affect the product.
Co-requisite: BMD 212

BMD 110 Introduction to A & P I 4 cr
An introduction to the structure and function of the human body with an emphasis on anatomy. This course surveys anatomical terminology, basic chemistry, cell structure/function, tissues, skin skeleton, joints, muscles, and central nervous system.

BMD 111 Introduction to A & P II 4 cr
Continuation of BMD 110. Topics include, peripheral/autonomic nervous system, endocrinology, cardiovascular system, blood, respiration, digestion, metabolism/nutrition, urinary system, and reproduction.
Pre-requisite: BMD 110 Minimum Grade of C.

BMD 200 Career Planning 1 cr
Clinical Observations (Medicine, Dentistry, Optometry and Veterinary Medicine). This course gives the student clinical exposure to various health-care services. It is designed to help students make informed decisions when selecting a career in the health professions. A written report on the clinical experience or scenario dealing with "medical ethics" is required. May be repeated for a maximum of six hours' credit. Permission of the Director of Health Pre-Professional Program is required.
Pre-requisite: CH 131 Minimum Grade of D and BLY 121 Minimum Grade of D.

BMD 201 Seminars in Biomedical Science 1 cr
This course introduces students to contemporary biomedical research and career possibilities in the biomedical sciences. Students will use the resources of the Biomedical Library to perform a literature search.

BMD 210 Microbiology in Healthcare 3 cr
This course introduces concepts of human host-infectious microbe interactions that result in disease. Microorganisms examined include viruses, parasites, fungi, mycobacteria, and bacteria. Included topics are genetics, taxonomy, microbial metabolism, virulence factors, host defense/microbe evasion mechanisms, epidemiology, antimicrobial chemotherapy/resistance, merging/reemerging infectious diseases, and diagnostic criteria. Emphasis will be placed on the microbial infections of different body systems.
Pre-requisite: BLY 101 Minimum Grade of C or BLY 121 Minimum Grade of C or CH 101 Minimum Grade of C or CH 131 Minimum Grade of C.

BMD 212 Introduction to Food Science 3 cr
This course is an introduction to digestion, absorption, transportation, and utilization of nutrients. It will discuss the integration of basic chemical, physical, microbiological and nutritional properties and components of food and their relationship to a healthy lifestyle. Lab exercises are completed in which students prepare foods and observe the chemical and physical properties that affect the product.

BMD 251 Human Anatomy & Physiology I 4 cr
This is the first of a two-course sequence that covers basic human anatomy and physiology, including the study of the structure and function of various body systems. Included is a study of basic principles of organism homeostasis, biochemical makeup, a study of cells and tissue, cellular metabolism, joints, the integumentary, and skeletal systems, muscular and nervous systems, and the senses. Laboratory experiences are provided through demonstration and interactive (virtual) laboratories.
Pre-requisite: BLY 101 Minimum Grade of C or BLY 121 Minimum Grade of C or CH 100 Minimum Grade of C or CH 131 Minimum Grade of C.

BMD 252 Human Anatomy & Physiology II 4 cr
A continuation of BMD 251. Topics include nervous, cardiovascular, lymphatic, immune, respiratory, digestive, and urinary systems. Additional topics may include blood, metabolism, immunology and reproduction. Laboratory experience is provided through demonstration and interactive (virtual) laboratories.
Pre-requisite: BMD 251 Minimum Grade of C.

BMD 290 Sp Top - H - 1 TO 3 cr
Topics of current health interest.

BMD 311 Human Anatomy 3 cr
A course in human gross and microscopic anatomy in a systematic approach, with an emphasis on structure-function relationships at the cell, tissue and organ level. The topics include anatomy of integumentary, musculoskeletal, nervous, cardio-vascular, lymphatic, respiratory, digestive, urinary and reproductive systems. This course is lecture-based with no lab component.
Pre-requisite: BLY 121 Minimum Grade of D.
BMD 321  Biochemistry I-Molecular Biol  3 cr  
The course covers different aspects of molecular biology  
including protein structure and function, carbohydrate,  
lipids, DNA replication, transcription and translation and  
applications to medical problems (i.e., forensic medicine,  
diagnosis of genetic diseases, etc).  
Pre-requisite: CH 201 Minimum Grade of D.

BMD 322  Biochemistry II-Metabolism  3 cr  
The course discusses the chemical basis of metabolism  
including the conversion of nutrients from digestion to either  
molecules of biological relevance or to energy. Genetic  
diseases affecting these pathways are described and  
discussed.  
Pre-requisite: (BMD 321 Minimum Grade of C or BLY 440  
Minimum Grade of C or CH 440 Minimum Grade of C) and  
CH 201 Minimum Grade of D.

BMD 323  Biochemistry Laboratory  2 cr  
This laboratory is designed to provide hands-on  
experience on several biochemical techniques including  
cell fractionation, chromatography, DNA isolation,  
electrophoresis, determination of enzyme activity, etc.  
Co-requisite: BMD 322  
Pre-requisite: BMD 321 Minimum Grade of C.

BMD 334  Human Physiology I  3 cr  
The objectives of this course are to study human physiology  
with emphasis on cellular physiology ( cell structure,  
metabolism, and transport) and the endocrine and nervous  
systems and skeletal muscle. This course is the first of a 2  
course sequence.  
Pre-requisite: BLY 121 Minimum Grade of C and CH 131  
Minimum Grade of C and CH 132 Minimum Grade of C.

BMD 335  Human Physiology II  3 cr  
Study of human physiology with emphasis on the basic  
principles of organ system physiology. The course  
emphasizes muscle, cardiovascular, renal, respiratory,  
digestive, and reproductive physiology and an introduction  
to immunology. This is the second course in a 2 course  
sequence.  
Pre-requisite: BMD 334 Minimum Grade of C.

BMD 336  Physiology Lab - W  2 cr  
This laboratory is designed to provide students with hands-  
on laboratory experience in physiology, with emphasis  
on the musculoskeletal, cardiovascular, respiratory and  
nervous systems. Limited to BMD majors unless by special  
permission. Special fee.  
Co-requisite: BMD 335  
Pre-requisite: (BMD 334 Minimum Grade of C and (EH 102  
Minimum Grade of C or EH 105 Minimum Grade of C) ).

BMD 350  Human Genetics and Genomics  3 cr  
The course is designed to introduce students to the  
fundamental concepts of molecular genetics and genomics.  
The concepts that will be covered in this course include  
nucleic acid structure and function, mechanisms of  
replication, transcription, translation, gene expression  
and regulation. In addition, the course aims to familiarize  
students with modes of analysis used in comparative  
genomic research.  
Pre-requisite: BMD 321 or BLY 301 or BLY 440.

BMD 351  Global Health  3 cr  
This course introduces students to the basic principles of  
global public health that are used to improve population  
health at all levels. Students will get an overview of the  
determinants of health and how health status is measured.  
Students will also review the burden of disease, who is most  
affected by different disease burdens, risk factors, and key  
measures to address the burden of disease in cost-effective,  
doable, sustainable, and fair ways. Special attention will  
be paid throughout the course to health systems issues.  
The course will cover key concepts and frameworks but be  
practical in orientation. The course will be global in coverage  
but with a focus on low- and middle-income countries, the  
health of the poor and health disparities. Particular attention  
will be paid throughout the course to the linkages between  
health and development.

BMD 390  Sp Top -  1 TO 3 cr  
Topics of current health interest.

BMD 401  Immunology  3 cr  
This course presents the basic concepts of  
imunochemistry, immunobiology and host immune  
responses to disease. Antigens, antibodies, cells and  
structures of the immune system will be discussed as  
well as their roles in the processes of immunity, allergies,  
transplantation, and diseases.  
Pre-requisite: BMD 321 Minimum Grade of C. BMD 321 can  
be taken concurrently with this course.

BMD 402  Medical Microbiology  4 cr  
This course presents the concepts of pathogenicity and  
virulence as they relate to disease causing bacteria,  
mycobacteria, fungi, protozoans, and viruses. Mechanisms  
of pathogenicity, host interactions, epidemiology and  
diagnosis will be emphasized. General concepts of microbial  
physiology, taxonomy, genetics, host immune response,  
and antimicrobial therapy are also presented. The laboratory  
portion of the course will provide hands-on experience in the  
handling and identification of each microbe class. Special  
fee.  
Pre-requisite: (BMD 321 Minimum Grade of C or BLY 440  
Minimum Grade of C or CH 440 Minimum Grade of C). BMD 321  
can be taken concurrently with this course.
BMD 403  Molecular Basis of Cancer  3 cr
This course will focus on the biological and molecular features of oncogenesis and clinical cancer, with specific attention given to the molecular events underlying carcinogenesis, metastasis, and angiogenesis. Recent therapeutic advances and their implications for the field will be explored through reading of current scientific literature. Case study learning is integrated into the course to help students understand the societal implications of cancer. Pre-requisite: BMD 321 Minimum Grade of C or BLY 301 Minimum Grade of C or BLY 302 Minimum Grade of C.

BMD 410  Pathophysiology  3 cr
A systematic study of disease processes involving relationships between pathophysiological changes and clinical manifestations. Pre-requisite: BMD 321 Minimum Grade of C.

BMD 420  Pharmacology  3 cr
An introduction to pharmacological concepts and effects and uses of major drug classes. Drug design, pharmacodynamics (receptors, mechanisms, dose-response) and pharmacokinetics (time action) are discussed in general (principles), and in particular, for selected classes of drugs. Pre-requisite: (BMD 321 Minimum Grade of C or BLY 440 Minimum Grade of C or CH 440 Minimum Grade of C).

BMD 430  Neurosciences  4 cr
A study of neuroscience which integrates neurochemistry, neuroanatomy, and neurophysiology, emphasizing cellular neurobiology, neural systems, and the neurobiology of behavior. Course includes laboratory experience. Pre-requisite: BMD 311 Minimum Grade of C and BMD 334 Minimum Grade of C.

BMD 450  Introduction to Research  2 cr
Fundamental principles of research will be presented and applied. Students will examine and evaluate a selection of contemporary research and learn many of the responsibilities of professional researchers, particularly in academic settings. Oral classroom presentations are required. Pre-requisite: BMD 311 Minimum Grade of C and BMD 321 Minimum Grade of C and BMD 323 Minimum Grade of C and BMD 334 Minimum Grade of C and BMD 336 Minimum Grade of C.

BMD 490  Special Topics  1 TO 3 cr
Topics of current health interest.

BMD 493  Ethical Issues in Health - W  3 cr
This course will provide an open forum for discussion of current controversial issues in biomedical sciences. The topics will include research integrity, discussions on the impact of medical advances in society as well as issues of historical relevance. Pre-requisite: BLY 121 Minimum Grade of C and EH 102 Minimum Grade of C.

BMD 494  Directed Research Studies  1 TO 3 cr
The student will perform a biomedical research project under the direction of a faculty mentor. This will include literature searches and presenting the project in a written format. Instructor Permission Required. Pre-requisite: BMD 321 Minimum Grade of C.

BMD 499  Honors Research Thesis - W - H  1 TO 6 cr
Literature survey and laboratory research experience under the direction of the faculty. Instructor permission required. Pre-requisite: BMD 311 Minimum Grade of C and BMD 322 Minimum Grade of C and BMD 323 Minimum Grade of C and BMD 335 Minimum Grade of C and BMD 336 Minimum Grade of C.

BMD 501  Immunology  3 cr
This course presents the basic concepts of immunochemistry, immunobiology, and host immune responses to disease, antigens, antibodies, cells and structures of the immune system will be discussed as well as their roles in the process of immunity, allergies, transplantation and diseases. A term paper is required.

BMD 502  Medical Microbiology  5 cr
The course presents the concept of pathogenicity and virulence as they relate to disease causing bacteria, viruses, and fungi. Mechanisms of pathogenicity, interrelationships, and interactions that occur between the host, the parasite and their environments will be emphasized in molecular terms. General concepts of microbial physiology, genetics, and antimicrobial therapy are also presented. The laboratory portion of the course will provide hands-on experience in the handling and identification of bacteria. A term paper is required.