

# BMD-Biomedical Sciences

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## Courses

### **BMD 150. Introduction to the Biomedical Sciences. 1 Hour.**

Introduction to career paths within the Biomedical Sciences. Topics will address student needs and interests and current trends in the Biomedical Sciences. Emphasis will be placed on developing an individualized educational plan based on a student's academic and professional interests.

### **BMD 201. Contemporary Issues in Biomedical Sciences. 2 Hours.**

A survey of current policy topics and industry trends in biomedical sciences, health, and medicine.

### **BMD 202. Survey of the Biomedical Sciences Literature. 1 Hour.**

Techniques for searching, retrieving, reading, and analyzing the expert information used by biomedical researchers and health professions practitioners.

### **BMD 203. Contemporary Issues and the Literature in Biomedical Sciences. 3 Hours.**

Synthesizing contemporary topics in biomedical sciences with techniques for searching, retrieving, reading, and analyzing expert information.

### **BMD 300. Laboratory Techniques in Biotechnology I. 2 Hours.**

Basic laboratory techniques in biotechnology utilizing a lab notebook, basic lab instruments, and making solutions. Basic molecular biology and mammalian cell culture techniques used in studying gene regulation.

**Prerequisites:** BMD 320 [Min Grade: C]

### **BMD 310. Clinical Anatomy and Histology. 4 Hours.**

Exploration of the functional anatomy of the human body through gross and microscopic studies of cells, tissues, and organ systems; survey of body systems; correlations between the structures and functions of the body's various systems; association of major embryonic developmental events with functional gross anatomy.

**Prerequisites:** BY 124 [Min Grade: C](Can be taken Concurrently) and CH 235 [Min Grade: C](Can be taken Concurrently) or CH 245 [Min Grade: C](Can be taken Concurrently) and CH 236 [Min Grade: C](Can be taken Concurrently)

### **BMD 315. Clinical Physiology and Pharmacology for Health Professions I. 4 Hours.**

Basic concepts of physiology and pharmacology related to human organ systems and drug categories; human physiological principles and their application to pharmacology; membrane physiology, muscle physiology, physiology of the autonomic nervous system and the cardiovascular system; application of physiologic principles to drug pharmacokinetic and pharmacodynamics models.

**Prerequisites:** (CH 115 [Min Grade: C] or CH 125 [Min Grade: C]) and (CH 116 [Min Grade: C] or CH 126 [Min Grade: C]) and (CH 117 [Min Grade: C] or CH 127 [Min Grade: C]) and (CH 118 [Min Grade: C] or CH 128 [Min Grade: C]) and BY 123 [Min Grade: C] and BY 124 [Min Grade: C] and (CH 235 [Min Grade: C] or CH 245 [Min Grade: C] and CH 236 [Min Grade: C]) and BMD 310 [Min Grade: C] and CH 237 [Min Grade: C](Can be taken Concurrently) or CH 247 [Min Grade: C] (Can be taken Concurrently) and CH 238 [Min Grade: C](Can be taken Concurrently)

### **BMD 317. Clinical Physiology and Pharmacology for Health Professions II. 4 Hours.**

Basic concepts of physiology and pharmacology related to human organ systems and drug categories; human physiological principles and their application to pharmacology; renal, respiratory, gastrointestinal and endocrine systems; application of physiological principles to drug pharmacokinetic and pharmacodynamics models.

**Prerequisites:** BMD 315 [Min Grade: C]

### **BMD 320. Survey of Cell Biology for Health Professions. 3 Hours.**

Molecular and cellular biosciences from a highly-integrated systems perspective; principles of eukaryotic cell structure and function, macromolecules, gene expression, signaling, division, differentiation, energy transformation and metabolism in cells; endocytosis, intramembrane transport, protein targeting, organelle biosynthesis, protein sorting, exocytosis, cell shape, motility, and cell-to-cell interaction; signal transduction processes and cellular functions required for cell growth and programmed cell death.

**Prerequisites:** (CH 115 [Min Grade: C] or CH 125 [Min Grade: C]) and (CH 116 [Min Grade: C] or CH 126 [Min Grade: C]) and (CH 117 [Min Grade: C] or CH 127 [Min Grade: C]) and (CH 118 [Min Grade: C] or CH 128 [Min Grade: C]) and BY 123 [Min Grade: C] and BY 124 [Min Grade: C](Can be taken Concurrently) and (CH 235 [Min Grade: C] or CH 245 [Min Grade: C] and CH 236 [Min Grade: C]) and CH 237 [Min Grade: C](Can be taken Concurrently) or CH 247 [Min Grade: C] (Can be taken Concurrently) and CH 238 [Min Grade: C](Can be taken Concurrently)

### **BMD 330. Clinical Microbiology for Health Professions. 3 Hours.**

Clinically-based study of bacteriology, parasitology, mycology, and virology and the human host response to each; mechanisms of microbial pathogenicity and complex interactions with the host that produce symptoms of disease.

**Prerequisites:** (CH 115 [Min Grade: C] or CH 125 [Min Grade: C]) and (CH 116 [Min Grade: C] or CH 126 [Min Grade: C]) and (CH 117 [Min Grade: C] or CH 127 [Min Grade: C]) and (CH 118 [Min Grade: C] or CH 128 [Min Grade: C]) and BY 123 [Min Grade: C] and BY 124 [Min Grade: C] and BMD 320 [Min Grade: C]

### **BMD 331. Microbiology Lab for Health Professions. 1 Hour.**

Practice of laboratory safety, correct operation of a compound light microscope, preparation and interpretation of various stains, cultivate, isolate and identify pathogenic microorganisms, and perform and interpret simple serologic assays.

**Prerequisites:** BMD 330 [Min Grade: C](Can be taken Concurrently)

### **BMD 380. Research Methods and Scientific Literacy for the Biomedical Sciences. 3 Hours.**

Introduction to basic research methodology; review of statistical methods in health professions research. Emphasis will be given to preparing students to critically evaluate medical and scientific literature as well as web-based materials.

**Prerequisites:** MA 106 [Min Grade: C] or MA 107 [Min Grade: C] or MA 125 [Min Grade: C] or MA 168 [Min Grade: C] and BMD 203 [Min Grade: C]

### **BMD 400. Laboratory Techniques in Biotechnology II. 2 Hours.**

Laboratory techniques used in biotechnology, including cloning genes into an expression vector; transforming into *E. coli*; and transfection into mammalian cells for study of gene regulation and expression.

**Prerequisites:** BMD 300 [Min Grade: C]

**BMD 410. Clinical Biochemistry for Health Professions. 3 Hours.**

Current concepts of human biochemistry and molecular biology; protein structure and function, enzymes, intermediary metabolism, biosynthesis of lipids, and utilization of lipids; special emphasis on the molecular basis of inherited genetic diseases, acquired diseases, and clinically-related biochemistry.

**Prerequisites:** (CH 235 [Min Grade: C] or CH 245 [Min Grade: C]) and CH 236 [Min Grade: C] and (CH 237 [Min Grade: C] or CH 247 [Min Grade: C]) and CH 238 [Min Grade: C] and BMD 320 [Min Grade: C]

**BMD 420. Pathophysiology for Health Professions. 4 Hours.**

Problem-oriented capstone study of general disease processes and the major subdivisions of general pathology: cellular adaptations, tissue injury and renewal, neoplasia, environmental and nutritional pathology, and pediatric disorders; cellular alterations and inflammation, genetic, immunological, nutritional and circulatory disorders; effects of infection, chemical and physical agents, blood and vascular diseases, neoplasia and aging as they apply to selected organ systems.

**Prerequisites:** BMD 317 [Min Grade: C] and BMD 380 [Min Grade: C]

**BMD 430. Clinical Immunology for Health Professions. 3 Hours.**

Basic immunology and the fundamental principles relating to the immune response in normal and disease states; antigens, antibodies, cells and structures of the immune system; process of immunity, allergies, transplantation and diseases; emphasis on the genetics, mechanisms, and regulation of the immune system in human health and disease.

**Prerequisites:** BMD 320 [Min Grade: C] and BMD 330 [Min Grade: C] (Can be taken Concurrently) and BMD 410 [Min Grade: C] (Can be taken Concurrently)

**BMD 440. Human Genetics for Health Professions. 3 Hours.**

Upper level exploration of molecular basis and clinical presentations of human genetic disorders using a systems based approach; analysis relevant to clinical diagnosis and disease monitoring; ethical and moral issues associated with gathering and use of genetic information for non-medical activities; high level predictions of genetic evolution.

**Prerequisites:** BMD 320 [Min Grade: C] (Can be taken Concurrently)

**BMD 475. Capstone Experience in the Biomedical Sciences. 2-4 Hours.**

Mentored capstone project to explore an area of student interest demonstrating curriculum integration. The capstone project should culminate in a formal scholarly work. Senior Standing required.

**Prerequisites:** BMD 315 [Min Grade: C] and BMD 317 [Min Grade: C] and BMD 320 [Min Grade: C]

**BMD 478. Special Topics in Biomedical Sciences. 1-4 Hour.**

Exploration of current issues in Biomedical Sciences.

**BMD 490. Directed Readings in Biomedical Sciences. 1-3 Hour.**

Directed readings and/or literature review under the direction of a faculty member. Approval of faculty sponsor and program director required.

**BMD 495. Practicum in Biomedical Sciences. 1-6 Hour.**

Course combines the practical workplace experience gained through an internship or service learning activity with a seminar component to guide reflective assessment of the total experience. Approval of faculty sponsor and program director required.

**BMD 497. Directed Biomedical Sciences Research Studies. 1-6 Hour.**

Students will conduct a field, laboratory, or literary study project culminating in a formal paper and/or presentation as directed by the supervising instructor. Approval of faculty sponsor and program director required.