

# Biomedical Sciences

## Department Information

Biomedical Sciences Administrative Staff	(251) 445-9265
Chair	Nancy Rice
Professors	Rice
Professor Emeritus	Covey, Davis, Spector, Stanfield, Turrens
Associate Professors	Mockett, Ravine, Thulasiraman
Assistant Professors	Gorelik, Shokolenko, Swiger
Instructors	Henry

Department of Biomedical Sciences website

<https://www.southalabama.edu/colleges/alliedhealth/biomedical>

The Department of Biomedical Sciences focuses on providing students with a broad undergraduate science curriculum from a human perspective. The curriculum offers students a strong general education in the humanities, arts, social sciences, mathematics, and sciences, followed by in-depth study in the basic medical sciences. The program offers an optional Honors Research Thesis (BMD 499) to qualified students consisting of a laboratory apprenticeship in biomedical research under the mentorship of a faculty scientist. Students interested in the Honors Research Thesis option should contact Dr. Nancy Rice for information. The Biomedical Sciences curriculum establishes a foundation that prepares students to pursue post baccalaureate educational experiences in any biomedical discipline, particularly medicine, dentistry, pharmacy, optometry, as well as a Ph.D. degree in a variety of health and science related fields. In addition, the Department of Biomedical Sciences offers prerequisite course work for students wishing to in the Pat Capps Covey College of Allied Health Professions.

## Areas Of Study

Biomedical Sciences (BS)  
Minor in Biomedical Sciences

## Courses

### Allied Health Professions (AHP)

#### AHP 101 Freshman Sem in Allied Health 2 cr

A course for first-time students that assists with maximizing the student's potential to achieve academic success and to adjust responsibly to the individual and interpersonal challenges presented by college life. Taught in small groups, the course provides an introduction to the nature of higher education with special emphasis on health-related disciplines. Appropriate reading and writing assignments will be required.

#### AHP 390 Special Topics 1 TO 9 cr

The purpose of this course for the undergraduate student is to develop an improved understanding of culture, to recognize any cultural practices that affect health care, and to incorporate this understanding into the provision of care. Culture will be examined through writing, cultural experiences, and through collaboration.

**AHP 510 IPE Autism Spectrum Disorders 1 cr**

This foundational course is designed to prepare graduate students in OT, PT, SLP, MD and ED to provide high-quality services to individuals with autism spectrum disorder and other developmental disabilities. The emphasis will be on interprofessional education using team-based instruction to support effective interprofessional practice in both educational and health care settings. **ADDITIONAL RESTRICTION:** Students can only be enrolled following successful application and admission. Contact the course instructor for information on application.

**AHP 590 Special Topics 1 TO 9 cr**

Selected topics in Health Sciences. Requires special permission.

## Biomedical Sciences (BMD)

**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 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. Prereq: Permission of the Director of Health Pre-Professional Program.

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 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 122 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 and CH 202 Minimum Grade of D.
- BMD 323 Biochemistry Laboratory** 1 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 D and BLY 122 Minimum Grade of D and CH 131 Minimum Grade of D and CH 132 Minimum Grade of D.
- 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** 1 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.
- 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 390 Sp Top -** 1 TO 3 cr  
Topics of current health interest.
- BMD 401 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 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.
- 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 and BMD 322 Minimum Grade of C and BMD 334 Minimum Grade of C and BMD 335 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 335 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 Issues in Biomed Sciences - 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: BMD 321 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 325 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.

---

## Faculty

---

GORELIK, GABRIELA  
Assistant Professor  
PHD, Univ of Buenos Aires

HENRY, ALISON K.  
Instructor  
BS, Texas A & M University  
MS, Virginia Polytechnic Inst and  
EDD, University of South Alabama

MOCKETT, ROBIN J.  
Associate Professor  
BS, Queens University  
PHD, Southern Methodist University

RAVINE, TERRENCE J.  
Associate Professor  
BSMT, University of Akron  
MS, University of Akron  
PHD, Virginia Commonwealth U

RICE, NANCY A.  
Professor  
BS, Western Kentucky University  
PHD, Univ of Tenn Hlth Sci Center

SHOKOLENKO, INNA N.  
Assistant Professor  
MS, Kiev State Linguistic Univ  
PHD, Univ of South Alabama - COM

SWIGER, BRAD M.  
Assistant Professor  
BS, University of South Alabama  
PHD, University of South Alabama

THULASIRAMAN, PADMAMALINI  
Associate Professor  
BS, McGill University Quebec  
MS, University of Oklahoma-Norman  
PHD, University of Illinois-Urbana

WILK BROWN, ANNA M.  
Part-Time Instructor  
MS, Jagiellonian University  
PHD, Jagiellonian University