Biomedical Sciences

Program Director

The B.S. in Biomedical Sciences program curriculum is designed to prepare students for entry into the biomedical science workforce or for graduate and professional study in the health professions. Many of the prerequisites for admission to identified graduate programs can be incorporated into the student's program of study. This allows students to create a tailored undergraduate educational experience to prepare for further study in an area of choice such as physician assistant studies, medicine, dentistry, optometry, physical therapy, biotechnology, clinical laboratory science, genetic counseling, and many more.

Admission Requirements

Admission options are based on the student's previous academic work and personal interests. Students intending to enroll in the B.S. in Biomedical Sciences program must meet all UAB undergraduate admission and academic requirements. The following additional requirements also apply and must be met prior to acceptance into the Biomedical Sciences program.

1. Program Admission from High School
   Must be a graduate of an accredited high school with a grade point average of a 2.75 or higher on a 4.0 scale for admission. Achieved an ACT Composite Score of 22 or higher.
   Must place in College English 101 or higher and College Math 105 or higher.
   Must meet all UAB undergraduate admission and academic requirements.
   If accepted, complete the UAB medical history questionnaire and physical, provide proof of required immunizations, and receive satisfactory screening by the UAB Medical Center Student Health Service.
   If accepted, a background check and drug screening will be required at admission and may be required again prior to any practicum or lab placement.

2. Program Admission from Community College or University, including UAB
   Must meet all UAB undergraduate admission and academic requirements.
   If accepted, complete the UAB medical history questionnaire and physical, provide proof of required immunizations, and receive satisfactory screening by the UAB Medical Center Student Health Service.
   Must hold a 2.75 or higher Overall GPA on a 4.0 scale for admission to the Biomedical Sciences Program.
   If accepted, a background check and drug screening will be required at admission and may be required again prior to any practicum or lab placement.

3. Other Biomedical Sciences Program Requirements
   Grades of C or better are required for any Biomedical Sciences curriculum requirements.
   A minimum of 2.75 Overall GPA and 2.00 UAB institutional GPA must be maintained to remain enrolled in the B.S. in Biomedical Sciences program.

Application Procedure

Applicants are accepted at any time, and students may be enrolled during any term. Applicants should submit the following materials:

To the UAB Undergraduate Admissions Office:

- Completed UAB undergraduate application form, including SHP as the school, and application fee, if applicable (if enrolled at UAB in another major, complete a Change of School/Major Request using the online form available on BlazerNET).
- Official transcripts from each college or university attended

Recommended Courses Core Curriculum

Students, in consultation with their academic advisor, should sequence requirements to meet any stated prerequisite requirements for specific courses in their curriculum, including UAB Core Curriculum requirements stated in this catalog.

Although the courses listed below are recommendations, students are required to earn a satisfactory grade in MA 106 or MA 125 for the major.

Area II (non-Literature option): CMST 101
Area III Mathematics: MA 106 or MA 125
Area IV non-History: PY 101 or PY 212

Contact for additional information:
B.S. in Biomedical Sciences Program (BMD) Program
School of Health Professions Building
University of Alabama at Birmingham
1705 University Boulevard
Telephone: (205) 996-4721
Email: bmd@uab.edu (askCDS@uab.edu)
Web address: http://www.uab.edu/shp/cds/biomedical-sciences

Major Requirements for Bachelor of Science in Biomedical Sciences

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<tr>
<th>Requirements</th>
<th>Hours</th>
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<tr>
<td>First Year Experience</td>
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<tr>
<td>HRP 101 Experience the Univ Transition</td>
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<tr>
<td>Chemistry Requirements</td>
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<tr>
<td>CH 115 General Chemistry I</td>
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<tr>
<td>CH 116 General Chemistry I Laboratory</td>
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<td>or CH 114 General Chemistry I Laboratory (Honors)</td>
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<tr>
<td>CH 117 General Chemistry II</td>
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<tr>
<td>Nutrition Requirement</td>
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<td>CDS Requirement</td>
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<tr>
<td>CDS 420 Competencies in Genetics for Health Professions</td>
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<tr>
<td>Statistics Requirement</td>
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### Biomedical Science Electives

<table>
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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>BMD 320</td>
<td>NTR 222</td>
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<tr>
<td>BMD 310</td>
<td>CH 238 or 239</td>
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<tr>
<td>BMD 315</td>
<td>BY 124</td>
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<tr>
<td>BMD 316</td>
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**Total Hours:** 18-20

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**BMD 300** 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. 1 Hour.
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 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: CH 117 [Min Grade: C] and CH 117R [Min Grade: N] and (CH 118 [Min Grade: C] or CH 119 [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 123 [Min Grade: C]

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 114 [Min Grade: C] and CH 115 [Min Grade: C] and CH 116 [Min Grade: C] and CH 117 [Min Grade: C] and (CH 118 [Min Grade: C] or CH 119 [Min Grade: C]) and BY 123 [Min Grade: C] and BY 124 [Min Grade: C]

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 114 [Min Grade: C] and CH 115 [Min Grade: C] and CH 116 [Min Grade: C] and CH 117 [Min Grade: C] and (CH 118 [Min Grade: C] or CH 119 [Min Grade: C]) and BY 123 [Min Grade: C] and BY 124 [Min Grade: C]

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: BMD 320 [Min Grade: C]

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: HCM 360 [Min Grade: C] or MA 180 [Min Grade: C] or QM 214 [Min Grade: C] or PY 216 [Min Grade: C] or PUH 250 [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 234 [Min Grade: C] and CH 235 [Min Grade: C] or CH 236 [Min Grade: C] and CH 237 [Min Grade: C] and (CH 238 [Min Grade: C] or CH 239 [Min Grade: C])

BMD 420. Pathophysiology for Health Professions. 4 Hours.
Problem-oriented 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]

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]

BMD 475. Capstone Experience in the Biomedical Sciences. 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.

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.