

Human Biology Program (BA)

The Bachelor of Arts Program in Human Biology is designed to provide students with a background in human-related biology courses as the focus of a broad and liberal education and in preparation for entrance into a variety of professional programs for healthcare providers. Specific tracks are tailored to serve students interested in careers as a physical therapist, physician assistant, physician or dentist. Students also should consult websites of programs to which they might apply for specific requirements beyond those listed in the tracks below.

Requirements.

- A. Biology. Thirty-two (*minimum*) to 40 (*maximum*) credits in biology, with at least 18 at the 300 level or above, to include:
 1. Biology core courses, each with a grade of C- (1.7) or better. BIO 111, BIO 113, BIO 167, BIO 168, BIO 326.
 2. BIO 432 (*capstone*).
- B. Foundational oral communication, with a grade of C (2.0) or better. COM 210 or COM 338.
- C. Foundational written communication, with a grade of C (2.0) or better. COM 225 or ENG 345.
- D. Healthcare delivery to diverse cultures. HCR 362 .
- E. Mathematics. MTH 111 or equivalent proficiency by examination.
- F. Ethics, each with a grade of C (2.0) or better. PHL 101 or PHL 168 ; PHL 338 or PHL 344 .
- G. General psychology. PSY 100 .
- H. Statistics. BIO 301 (*recommended*) or PSY 322 or SOC 215 .
- I. Completion of one of the following concentrations:

Pre-Physician Assistant Concentration

1. BIO 433 or BIO 445, BIO 405/406) or BIO 135.
2. CHM 150, CHM 151; CHM 252 and CHM 253, or CHM 220 and CHM 350.
3. NSC 209.
4. PSY 313 (*recommended*) or PSY 315.

Pre-Physical Therapy Concentration

1. CHM 150, CHM 151, CHM 252, CHM 253.
2. MTH 120 or equivalent proficiency by examination.
3. MTP 320 or MTP 321.
4. PHY 143 or PHY 243, PHY 145 or PHY 245.
5. PSY 313.
6. PTP 201, PTP 413.
7. Electives, chosen with an advisor may include, but are not limited to, these recommended courses:
BIO 447, HCR 300.

Pre-Medical Concentration

1. BIO 328, BIO 405/406 (or BIO 435).
2. CHM 260, CHM 261, CHM 262, CHM 263 or CHM 265, CHM 330, CHM 331, CHM 332, CHM 333; CHM 350 or CHM 450 and CHM 452.
3. MTH 120 or equivalent proficiency by examination.
4. PHY 143 or PHY 243, PHY 145 or PHY 245.
5. PSY 309 (*recommended*) or PSY 316, PSY 315.
6. Electives, chosen with an advisor may include, but are not limited to, these recommended courses: BIO 418, BIO 419; BIO 425, BIO 433, BIO 445, HCR 300, PHS 315.

Pre-Dental Concentration

1. BIO 328, BIO 405/406 (or BIO 435).
2. CHM 260, CHM 261, CHM 262, CHM 263 or CHM 265, CHM 330, CHM 331, CHM 332, CHM 333; CHM 350 or CHM 450, CHM 452.
3. MTH 120 or equivalent proficiency by examination.
4. PHY 143 or PHY 243, PHY 145 or PHY 245.
5. PSY 313 or PSY 315.
6. Electives, chosen with an advisor may include, but are not limited to, these recommended courses: BIO 418, BIO 419; BIO 425, BIO 433, BIO 445, HCR 300, PHS 315.

J. All requirements of the College of Arts and Sciences Bachelor of Arts degree, including:

1. General Education requirements.
2. BA distribution requirements, which include completion of the second semester of a foreign language or successful transfer of the second semester of a foreign language.
3. Completion of a minimum of 120 credits.
4. At least 33 credits in upper-division courses (numbered 300 or above).
5. A cumulative grade point average of 2.0 or better in biology and at UM-Flint overall.

Example Curricular Plan for the Human Biology Program (B.A.)

Semester						Credit hrs.
Fall	BIO 111 (4) Organismal Bio.	UNV 100 (3) First-Year Experience.	ENG 111 (3) College Rhetoric	MTH 111 (3) College Algebra	HCR 103 (1) Aerobic Conditioning	14
Winter	CHM 150/151 (4) Gen. Chem. Health Sci.	BIO 167 (4) Anat. & Physio. I	ENG 112 (3) English Comp.	MTH 120 (4) <i>fq</i> Pre-calculus		15
Spring						
Summer						
Fall	BIO 168 (4) <i>hw</i> Anat. & Physio. II	CHM 220 (3) Fundamentals Organic Chm	PSY 100 (3) <i>s</i> Principles of Psych.	General Ed. (3) Fine Arts	HCR 101 (1) Physical Fitness	14
Winter	BIO 113 (4) Principles of Bio.	CHM 350 (3) Fundamentals of Biochem.	PHL 168 (3) <i>h</i> Bioethics	COM 210 (3) <i>h</i> Intro Public Speaking	HCR 103 (1) Aerobic Conditioning	14
Spring						
Summer						
Fall	BIO 326 (4) Cell Biology	Foreign Language I (4) (GE Global Studies)	PHY 143 (4) College Physics I	General Ed. (3) <i>t</i> Technology		15
Winter	BIO 301 (4) Biostatistics	Foreign Language II (4)	PHY 145 (4) College Physics II	General Ed. (3) Social Science		15
Spring	Elective (3)	Elective (3)				6
Summer						
Fall	BIO 433 (5) Pre-Med Gross Anat.	General Ed. (3) U.S. Diversity	PHL 338 (3) Phl.Health Dis. Ill.	Elective (3)		14
Winter	BIO 432 (4) Mammalian Physiology	BIO XXX (3) Elective	HCR 362 (3) Cultural Comp. H-C	Elective (3)		13
				Total credit hrs.		120

Biology Courses Referenced in this Program:

111. Organismal Biology. (4) *n,nl*. Introduction to basic principles of biology relating to biodiversity. Survey of microorganisms, fungi, plants and animals, including aspects of classification, development, structure (anatomy) and function (physiology). Lecture and laboratory emphasizing guided discovery and critical thinking.

113. Principles of Biology. *CHM 140 or equivalent.* (4). Introduction to basic principles of biology relating to cell structure and function, cell reproduction and mechanisms underlying patterns of inheritance, ecology and evolution. Lecture and laboratory emphasizing guided discovery and critical thinking.

135. Microbiology Basics. (4) *n*. Elementary treatment of basic microbiological principles. Lecture and laboratory.

167. Human Anatomy and Physiology I. *MTH 111 with a grade of C (2.0) or better.* (4). Study of the structure and function of cells, tissues and four human body systems; emphasis on the integumentary, skeletal, muscular, and nervous systems. Lecture and laboratory.

168. Human Anatomy and Physiology II. *BIO 167 with a grade of C- or better.* (4) *hw*. Study of the structure and function of the human endocrine, cardiovascular, digestive, excretory, reproductive, and respiratory systems. Lecture and laboratory.

301. Biostatistics. *Strong preparation in high school or college algebra and eight credits of biology.* (4). Analysis of quantitative data from biological sources, using basic statistical procedures to elucidate biological phenomena. Mathematical derivations and probabilistic theory not stressed; emphasis on the selection and interpretation of statistical tests commonly used by biologists. Prior knowledge of statistics not necessary. Lecture and discussion. *Also listed as HCR 302.*

326. Cell Biology. *BIO 111, 113 with grades of C- (1.7) or better; prior or concurrent election of CHM 262, or grade of C (2.0) or better in CHM 220 or CHM 252; or consent of instructor.* (4) Biological systems from molecular to gross cell structure: such concepts as energy conversion, organization, growth, homeostasis, and cellular interactions. Examples from both animal and plant kingdoms. Lecture and laboratory.

328. Genetics. *BIO 111, 113; CHM 140 or its equivalent; or consent of instructor.* (4). Principles of inheritance from molecular through population levels. Gene action, cytoplasmic inheritance, parthenogenesis, mutation, and homeostasis. Lecture and discussion.

405. Microbiology Lecture. *BIO 111, 113, 326. BIO 328 highly recommended.* (3). Biology of microorganisms with emphasis on prokaryotes and viruses. Includes microbial anatomy,

physiology, growth, genetics, control and medical aspects of host-parasite relationships. Not open to students with credit for BIO 435 without instructor consent.

406. Microbiology Laboratory. *BIO 405 with a grade of C- (1.7) or better or concurrent election of BIO 405. (1).* Laboratory study of microbial life, building skills in fundamental microbiological laboratory techniques to include microscopy, aseptic and pure culture techniques, and an introduction to the identification, control and characterization of, as well as applied uses for, microbial species. *Not open to students with credit for BIO 435 without instructor consent.*

418. Lectures in Histology and Organology. *BIO 111, 113, 326; concurrent election of BIO 419. (3).* Microscopic structure and function of mammalian cells, tissues, and organs. Lecture.

419. Histology and Organology Laboratory. *BIO 111, 113, 326; concurrent election of BIO 418; or consent of instructor. (2).* Identification of mammalian cells, tissues and organs. Laboratory.

425. Immunology. *BIO 111, 113, 326, 328; or consent of instructor. (3).* Physiology and chemistry of resistance to infection and responses to foreign biological substances of a potentially harmful nature. Includes natural immunity, antigen-antibody reactions, immunosuppression and tolerance, the complement system, hypersensitivity, immune deficiencies, autoimmunity, and tumor immunology. Applications include serology. Lecture.

432. Mammalian Physiology. *BIO 111, 113, 326; or consent of instructor. (4).* Detailed study of organ and organ-system function in mammals; emphasis on human function. Lecture and laboratory.

433. Premedical Gross Anatomy. *BIO 167 and BIO 168 with grades of C+ or better; or BIO 432 with a grade of C+ or better; or consent of instructor. Not open to students with credit for BIO 434(5).* Detailed study of the gross structure of the human body. Laboratory involves cadaver dissection. Lecture and laboratory.

444. Neuroscience. *BIO 167, BIO 168 with grades of C+ (2.3) or better, or BIO 432 with a grade of C+ (2.3) or better, or PSY 380 with a grade of C+ (2.3) or better; or consent of instructor. (3).* Study of the structure and function of the human nervous system from ion channels to neural pathways. Lecture and laboratory.

445. Regional Anatomy. *BIO 167, BIO 168 with grades of C+ (2.3) or better, or BIO 432 with a grade of C+ (2.3) or better, or consent of instructor. (3).* Study of regional human anatomy with emphasis on neurovascular relationships of the head, neck, thoracic cavity and limbs. Lecture and laboratory involving cadaver dissection.

477. Biology Senior Seminar. *Biology major, senior standing; or consent of instructor. (3).* Critical analysis of current biological research. Students learn to communicate biological concepts to other scientists and to the public using written (papers and posters) and oral (presentation) formats.

Cognate Course Titles:

CHM 150 General CHM for Health Sciences (3)
CHM 151 CHM Lab for Health Sciences (1)
CHM 220 Fundamentals of Organic Chemistry (3)
CHM 252 Bio Chemistry for Health Sciences (3)
CHM 253 Bio Chemistry Lab for Health Sciences (1)
CHM 260 Principles of Chemistry I (3)
CHM 261 General Chemistry Laboratory (1)
CHM 262 Principles of Chemistry II (3)
CHM 263 Intro Quantitative Analysis Lab (1)
CHM 265 Intro Quantitative Analysis Lab-Honors (1)
CHM 330 Organic Chemistry I (3)
CHM 331 Organic Chemistry Lab I (1)
CHM 332 Organic Chemistry II (3)
CHM 333 Organic Chemistry Lab II (1)
CHM 350 Fundamentals of Biochemistry (3)
CHM 450 Biochemistry I (3)
CHM 452 Biochemistry II (3)
COM 210 Intro to Public Speaking (3)
COM 338 Communications in Business (3)
HCR 300 Health Care In The US (3)
HCR 362 Cultural Competence in Health Care (3)
MTH 111 College Algebra (3)
MTH 120 Pre-Calculus Mathematics (4)
MTP 320 Medical Terminology for Health Professionals (2)
MTP 321 Introduction to Medical Terminology (1)
NSC 209 Nutrition for Health Care Practitioners (3)
PHL 101 Intro to Philosophy (3)
PHL 168 Philosophy of Bioethics (3)
PHL 338 Philosophy of Health, Disease and Illness (3)
PHL 344 Philosophy of Medical Ethics (3)
PHS 315 Introduction to Epidemiology(3)
PSY 100 Principles of Psychology (3)
PSY 309 Abnormal Psychology (3)
PSY 313 Developmental Psychology (3)
PSY 315 Survey of Social Psychology (3)
PSY 316 Biological Psychology (3)
PSY 322 Basic Statistics & Probability (3)
PHY 143 College Physics I (4)
PHY 145 College Physics II (4)
PHY 243 Principles of Physics I (5)
PHY 245 Principles of Physics II (5)
PTP 201 Intro to Physical Therapy (1)
PTP 413 Physiology of Exercise (4)
SOC 215 General Statistics (3)