

BIOLOGY, BACHELOR OF ARTS

College: College of Science and Health

Department: Biological Sciences

Student Type: Traditional Undergraduate

Degree: Bachelor of Arts

Campus: Lisle Campus

Progression in the Biological Sciences Programs (B.S. in Biology or B.A. in Biology)

A student in either Biology major (B.S. or B.A.) must complete the following with a grade of "C" or better in each of these courses and receiving no more than a total of three "W," "D," or "F" grades in these courses:

Code	Title	Hours
BIOL 1195	Principles of Organismal Lab	1
BIOL 1197	Principles of Organismal Biology	3
BIOL 1198	Principles of Biology	3
CHEM 1108	Preparatory General Chemistry (if required based on placement)	3
CHEM 1113	General Chemistry I	3
CHEM 1123	General Chemistry II	3
Total Hours		16

The entire introductory sequence must be completed prior to taking any 2000-level courses in BIOL. A transfer student must meet these requirements through equivalent transfer courses. Transfer students must complete their first two semesters with no more than two "W," "D," or "F" grades in College of Science lecture courses in the degree program.

If it is determined at any time that a student cannot continue in the Biology program or cannot graduate with a Biology degree, the student will be required to change their major and seek academic advising outside of that program.

We encourage students to further their learning by assisting in labs. However, only 2 semester credit hours in BIOL 2292 Biology Teaching will count toward the B.A. or B.S. in Biology major.

BIOL 3389 Biological Research and other College of Science research courses do not count as elective credits toward the B.A. in Biology major.

Requirements - Major

A student majoring in Biology (B.A. or B.S.) may only earn one major in the Biochemistry/Molecular Biology, Biology, Environmental Science, Health Science, Physics, and Medical Humanities programs.

B.A. in Biology provides core biology courses with more flexibility in choosing biology electives and cognates to fulfill a variety of health care related fields including the Diagnostic Medical Sonography program or Clinical Laboratory Sciences program. The B.A. in Biology major consists of 64 semester credit hours of coursework that must be completed with a grade of "C" or better.

The core requirements for a B.A. in Biology are:

Code	Title	Hours
Core Requirements		
CHEM 1113	General Chemistry I	3
CHEM 1114	General Chemistry I Laboratory	1
CHEM 1123	General Chemistry II	3
CHEM 1124	General Chemistry II Laboratory	1
MATH 1111	College Trigonometry	3
MATH 2229	Biostatistics	3
BIOL 1195	Principles of Organismal Lab	1
BIOL 1197	Principles of Organismal Biology	3
BIOL 1198	Principles of Biology	3
BIOL 1199	Principles of Biology Lab	1
BIOL 2250	Genetics	3
BIOL 4393	Great Ideas in Biology and Medicine	1
or BIOL 4394	Nature Writing	
NTSC 1101	College of Science and Health Experience	1
PHIL 2245	General Ethics	3
or PHIL 2248	Environmental Ethics	
Other Coursework		
Natural Sciences electives at the 1000-level or higher		16
3000-level or higher BIOL where 6 credits must be at the 4000-level		18
Total Hours		64

The core coursework is 30 semester credit hours. Coursework in the major must be completed with a "C" or better.

Students seeking to complete one of the Allied Health Programs with an affiliate should follow the requirements of the program and major with the BA in Biology using one of the following tracks:

Students who may wish to attend graduate or professional school in most biological fields should consult their faculty advisor and take: CHEM 2242 Organic Chemistry I, CHEM 2243 Organic Chemistry I Laboratory, CHEM 2247 Organic Chemistry II, CHEM 2248 Organic Chemistry II Laboratory, CHEM 3261 Principles of Biochemistry in addition to the general chemistry sequence.

Requirements - Clinical Lab Science Track

Students in the Clinical Laboratory Science program must complete at least 90 semester credit hours with a minimum GPA of 2.800 at Benedictine University. Students **must apply** for admission to Edward Hines Jr. V.A. Hospital, our clinical educational program affiliate hospital, during their junior year by December 1. Only U.S. citizens may enter the Hines V.A. Program. The admissions process is competitive. Your senior year is a 12-month, 32-semester-credit-hour clinical education curriculum in the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS).

In addition to the University graduation requirements, the student majoring in Clinical Laboratory Science must complete the following courses:

Code	Title	Hours
CHEM 1113	General Chemistry I	3
CHEM 1114	General Chemistry I Laboratory	1
CHEM 1123	General Chemistry II	3
CHEM 1124	General Chemistry II Laboratory	1
CHEM 2242	Organic Chemistry I	3

CHEM 2243	Organic Chemistry I Laboratory	1
CHEM 2247	Organic Chemistry II	3
CHEM 2248	Organic Chemistry II Laboratory	1
BIOL 1195	Principles of Organismal Lab	1
BIOL 1197	Principles of Organismal Biology	3
BIOL 1198	Principles of Biology	3
BIOL 1199	Principles of Biology Lab	1
BIOL 3208	General Microbiology	4
BIOL 2250	Genetics	3
BIOL 4340	Cell Biology	3
BIOL 4341	Cell Molecular Biology Laboratory	1
BIOL 5354	Immunology	3
MATH 1111	College Trigonometry (or higher)	3
MATH 2229	Biostatistics	3
NTSC 1101	College of Science and Health Experience	1
PHYS 1113	College Physics I	3
PHYS 1114	College Physics I Laboratory	1
CMSC 1180	Introduction to Computing	2
CMSC 1182	Science Applications Laboratory	1
PHIL 2245	General Ethics	3
Total Hours		55

All of the following CLSC courses must be completed with a grade of "C" or better.

Code	Title	Hours
CLSC 4390	Hematology	5
CLSC 4391	Clinical Microbiology	6
CLSC 4392	Clinical Biochemistry	8
CLSC 4393	Immunoserology	3
CLSC 4394	Immunohematology	4
CLSC 4395	Clinical Microscopy/Urinalysis	2
CLSC 4396	Coagulation	2
CLSC 4397	Special Topics	2
Total Hours		32

A student who plans to attend graduate or professional school should take CHEM 3261 Principles of Biochemistry.

Requirements - Diagnostic Medical Sonography Track

Students majoring in Diagnostic Medical Sonography will complete the first three years of coursework at Benedictine University with at least 90 semester credit hours. Students should complete all college graduation requirements during these three years, while maintaining a GPA of 2.800 or above. In the junior year, students must apply to Northwestern Memorial Hospital for the clinical education curriculum. The admissions process is competitive. During senior year, students will complete an 18-month, 46-semester-credit-hour clinical education curriculum at Northwestern Memorial Hospital. A certificate of qualification as a diagnostic medical sonographer will be awarded when students complete this program.

Students in the diagnostic medical sonography track must complete the following courses:

Code	Title	Hours
MATH 1111	College Trigonometry	3
MATH 2229	Biostatistics	3
CMSC 1180	Introduction to Computing	2
CMSC 1182	Science Applications Laboratory	1
PHIL 2245	General Ethics	3
HLSC 2291	Medical Terminology	2
CHEM 1113	General Chemistry I	3
CHEM 1114	General Chemistry I Laboratory	1
CHEM 1123	General Chemistry II	3
CHEM 1124	General Chemistry II Laboratory	1
BIOL 1195	Principles of Organismal Lab	1
BIOL 1197	Principles of Organismal Biology	3
BIOL 1198	Principles of Biology	3
BIOL 1199	Principles of Biology Lab	1
BIOL 3203	Human Anatomy	4
BIOL 2250	Genetics	3
BIOL 2251	Genetics Laboratory	1
BIOL 3258	Human Physiology	4
BIOL 5359	Pathophysiology	3
NTSC 1101	College of Science and Health Experience	1
PHYS 1113	College Physics I	3
PHYS 1114	College Physics I Laboratory	1
PHYS 1118	College Physics II	3
PHYS 1119	College Physics II Laboratory	1
Total Hours		54

In addition, the following courses must be completed with "C" or better.

Code	Title	Hours
DMSC 4300	Introduction to Sonography and Patient Care	2
DMSC 4320	Abdominal Sonography I	2
DMSC 4321	Abdominal Sonography I Lab	1
DMSC 4322	Abdominal Sonography II	3
DMSC 4323	Abdominal Sonography II Lab	1
DMSC 4330	Obstetrics and Gynecology Sonography I	2
DMSC 4331	Obstetrics and Gynecology Sonography I Lab	1
DMSC 4332	Obstetrics and Gynecology Sonography II	3
DMSC 4333	Obstetrics and Gynecology Sonography II Lab	1
DMSC 4350	Vascular Sonography I	2
DMSC 4360	Pediatric and Breast Sonography	1
DMSC 4370	Sonography Principles and Instrumentation I	2
DMSC 4371	Sonography Principles and Instrumentation II	2
DMSC 4372	Sonography Principles and Instrumentation III	1
DMSC 4390	Clinical Education I	3
DMSC 4391	Clinical Education II	3
DMSC 4351	Vascular Sonography I Lab	1
DMSC 4352	Vascular Sonography II	2
DMSC 4353	Vascular Sonography II Lab	2
DMSC 4380	Diagnostic Medical Sonography Seminar	2
DMSC 4382	Professional Research	2
DMSC 4392	Clinical Education III	3

DMSC 4393	Clinical Education IV	4
Total Hours		46

Requirements - Nuclear Medicine Technology Track

Students in the Nuclear Medicine Technology program must complete at least 90 semester credit hours with a minimum GPA of 2.800 at Benedictine University. Students **must apply** for admission to Northwestern Memorial Hospital, our clinical education program affiliate hospital, during their junior year. The admissions process is competitive. The senior year is a 13-month, 36-semester-credit-hour clinical education curriculum in an American Medical Association accredited hospital program affiliated with the University. Upon completion of this program, the student is eligible to take certifying examinations administered by the Nuclear Medicine Technology Certification Board and by the American Registry of Radiologic Technologists and the Board of Registry of the American Society of Clinical Pathologists. Students majoring in Nuclear Medicine Technology must complete the following courses with a grade of "C" or better:

Code	Title	Hours
CHEM 1113	General Chemistry I	3
CHEM 1114	General Chemistry I Laboratory	1
CHEM 1123	General Chemistry II	3
CHEM 1124	General Chemistry II Laboratory	1
BIOL 1195	Principles of Organismal Lab	1
BIOL 1197	Principles of Organismal Biology	3
BIOL 1198	Principles of Biology	3
BIOL 1199	Principles of Biology Lab	1
BIOL 3203	Human Anatomy	4
BIOL 2250	Genetics	3
BIOL 2251	Genetics Laboratory	1
BIOL 3258	Human Physiology	4
MATH 1111	College Trigonometry	3
MATH 2229	Biostatistics	3
NTSC 1101	College of Science and Health Experience	1
CMSC 1180	Introduction to Computing	2
CMSC 1182	Science Applications Laboratory	1
PHIL 2245	General Ethics	3
PHYS 1113	College Physics I	3
PHYS 1114	College Physics I Laboratory	1
PHYS 1118	College Physics II	3
PHYS 1119	College Physics II Laboratory	1
Total Hours		49

In addition, the following courses must be completed with "C" or better.

Code	Title	Hours
NMTC 4331	Management and Methods of Patient Care I	3
NMTC 4332	Radiation Safety & Protection	3
NMTC 4333	Radiation Physics and Instrumentation	3
NMTC 4334	Diagnostic Nuclear Imaging Clinical Practicum I	4
NMTC 4335	Clinical Nuclear Medicine Procedures I	3
NMTC 4336	Radionuclide Chemistry and Radiopharmacy	3
NMTC 4337	Radiation Biology	1
NMTC 4339	Clinical Correlation-Pathology	2
NMTC 4340	Radiation Detection & Instrumentation	3

NMTC 4342	Management and Methods of Patient Care II	1
NMTC 4344	Diagnostic Nuclear Imaging Clinical Practicum II	4
NMTC 4345	Clinical Nuclear Medicine Procedures II	3
NMTC 4348	Computed Tomography and Cross-Sectional Anatomy	2
NMTC 4349	Medical Terminology	1
Total Hours		36

Requirements - Radiation Therapy Track

Students in the Radiation Therapy program must complete at least 90 semester credit hours with a minimum GPA of 2.800 at Benedictine University. In the junior year, students **must apply** to Northwestern Memorial Hospital for the clinical education curriculum. The admissions process is competitive. The senior year is a 12-month, 33-semester-credit-hour clinical education curriculum at Northwestern Memorial Hospital, an accredited hospital program affiliated with the University. Upon completion of this program, the student is eligible to sit for the National Registry Examination in Radiation Therapy administered by the American Registry of Radiologic Technologists. Transfer students must complete 30 semester credit hours at Benedictine University to be considered an affiliate in the application process.

Radiation Therapy students must complete the following courses:

Code	Title	Hours
MATH 1111	College Trigonometry	3
MATH 2229	Biostatistics	3
CMSC 1180	Introduction to Computing	2
CMSC 1182	Science Applications Laboratory	1
PHIL 2245	General Ethics	3
CHEM 1113	General Chemistry I	3
CHEM 1114	General Chemistry I Laboratory	1
CHEM 1123	General Chemistry II	3
CHEM 1124	General Chemistry II Laboratory	1
BIOL 1195	Principles of Organismal Lab	1
BIOL 1197	Principles of Organismal Biology	3
BIOL 1198	Principles of Biology	3
BIOL 1199	Principles of Biology Lab	1
BIOL 3203	Human Anatomy	4
BIOL 2250	Genetics	3
BIOL 2251	Genetics Laboratory	1
BIOL 3258	Human Physiology	4
NTSC 1101	College of Science and Health Experience	1
PHYS 1113	College Physics I	3
PHYS 1114	College Physics I Laboratory	1
PHYS 1118	College Physics II	3
PHYS 1119	College Physics II Laboratory	1
Total Hours		49

In addition, the following courses must be completed with a "C" or better.

Code	Title	Hours
RADT 4330	Introduction to Technical Radiation Oncology	2
RADT 4331	Principles and Practice of Radiation Therapy I	3
RADT 4332	Pathology	2
RADT 4333	Radiation Physics	2

RADT 4334	Clinical Practicum I	3
RADT 4335	Medical Imaging	2
RADT 4336	Introduction to Radiologic Sciences	2
RADT 4337	Radiation Safety and Protection	2
RADT 4338	Principles and Practice of Radiation Therapy II	3
RADT 4339	Technical Radiation Oncology II	3
RADT 4340	Radiation Therapy Physics	2
RADT 4341	Quality Assurance and Healthcare Operations	2
RADT 4343	Clinical Practicum II	3
RADT 4345	Radiation Biology	1
RADT 4346	Advanced Imaging in Radiation Therapy	1
Total Hours		33

Requirements – Respiratory Care 3+2 Track

Students majoring in the Respiratory Care 3+2 track will complete the first three years of coursework at Benedictine University with at least 90 semester credit hours. Students must complete all college graduation requirements during these three years, while maintaining a GPA of 3.000 or above overall as well as in all prerequisite courses required by Rush University.

Code	Title	Hours
MATH 1111	College Trigonometry	3
MATH 2229	Biostatistics	3
BIOL 3203	Human Anatomy	4
BIOL 3208	General Microbiology	4
BIOL 3258	Human Physiology	4
BIOL 3259	Human Physiology Laboratory	1
CHEM 1113	General Chemistry I	3
CHEM 1114	General Chemistry I Laboratory	1
NTSC 1101	College of Science and Health Experience	1
PHYS 1113	College Physics I	3
PHYS 1114	College Physics I Laboratory	1
PSYC 1100	Survey of Psychology	3
Total Hours		31

In the junior year, students must apply to Rush University by March 1st for admission to the Master of Science degree in Respiratory Care. The admissions process is competitive. During senior year, students will complete the first year (Fall, Spring, Summer) of graduate education at Rush University consisting of a minimum of 30 semester hours. These courses will count toward the final 30 credits of the undergraduate degree at Benedictine University and will be transferred to Benedictine as BIOL 5777 elective credit only. Students must complete the minimum of 120 credits between Rush University and Benedictine to officially graduate from Benedictine University. A maximum of 30 credits of BIOL 5777 can be counted toward a student's Benedictine undergraduate degree. A minimum of 30 semester hours of coursework in the M.S. in Respiratory Care program at Rush must be completed with "C" or better for conferral of the B.A. in Biology degree. Students must apply for graduation through MyBenU during Fall of their senior year at the latest to graduate in Summer of their senior year.

Students are encouraged to apply for graduation before they start attending Rush. Participants must request an official transcript be sent from Rush University at the end of their first year at Rush University with at least 30 earned credits to receive credit toward their bachelor's degree

and graduate in Summer of their Benedictine senior year. Rush University will confer the M.S. in Respiratory Care degree upon completion of the remaining year of coursework (92 semester hours total). Students majoring in the Respiratory Care 3+2 track must complete the following courses:

Code	Title	Hours
MATH 1111	College Trigonometry	3
MATH 2229	Biostatistics	3
CMSC 1180	Introduction to Computing	2
CMSC 1182	Science Applications Laboratory	1
PHIL 2245/2246	General Ethics	3
CHEM 1113	General Chemistry I	3
CHEM 1114	General Chemistry I Laboratory	1
CHEM 1123	General Chemistry II	3
CHEM 1124	General Chemistry II Laboratory	1
BIOL 1195	Principles of Organismal Lab	1
BIOL 1197	Principles of Organismal Biology	3
BIOL 1198	Principles of Biology	3
BIOL 1199	Principles of Biology Lab	1
BIOL 3203	Human Anatomy	4
BIOL 3208	General Microbiology	4
BIOL 3258	Human Physiology	4
BIOL 3259	Human Physiology Laboratory	1
NTSC 1101	College of Science and Health Experience	1
PHYS 1113	College Physics I	3
PHYS 1114	College Physics I Laboratory	1
PHYS 1118	College Physics II	3
PHYS 1119	College Physics II Laboratory	1
PSYC 1100	Survey of Psychology	3
Total Hours		53

Requirements - Teaching License

Students who desire to be licensed to teach biology at the secondary level (grades 9-12) are to declare themselves as Biology majors and Education minors and register with the Benedictine University Education Program as teaching licensure candidates. Advising is then a joint responsibility of the Department of Biological Sciences and the School of Education.

Students must complete the requirement for a major in Biology as well as the requirements of the Teacher Licensure Program in Education which includes the Education minor (see Education [Elementary Education, Special Education and Minors in Education and Special Education] section).

Majors must complete 35 semester credit hours in biology, of which 30 semester credit hours are at the 2000 level or above, including 11 semester credit hours at the 3000 level or above, and required cognates with a grade of "C" or better. Coursework must include:

Code	Title	Hours
BIOL 1195	Principles of Organismal Lab	1
BIOL 1197	Principles of Organismal Biology	3
BIOL 1198	Principles of Biology	3
BIOL 1199	Principles of Biology Lab	1
BIOL 2204	Advanced Botany	3

BIOL 3208	General Microbiology	4
BIOL 2250	Genetics	3
BIOL 2251	Genetics Laboratory	1
BIOL 3258	Human Physiology	4
BIOL 2292	Biology Teaching	1
BIOL 3313	Evolution	3
or BIOL 3301	Human Evolution	
BIOL 4340	Cell Biology	3
BIOL 4341	Cell Molecular Biology Laboratory ¹	1
BIOL 4363	Ecology	3
BIOL 4364	Ecology Laboratory ¹	1
CHEM 1113	General Chemistry I	3
CHEM 1114	General Chemistry I Laboratory	1
CHEM 1123	General Chemistry II	3
CHEM 1124	General Chemistry II Laboratory	1
CHEM 2242	Organic Chemistry I	3
CHEM 2243	Organic Chemistry I Laboratory	1
CHEM 2247	Organic Chemistry II	3
CHEM 2248	Organic Chemistry II Laboratory	1
CHEM 3261	Principles of Biochemistry	3
or CHEM 4361	Biochemistry	
NTSC 1101	College of Science and Health Experience	1
PHYS 1107	Earth and Space Science	4
PHYS 1113	College Physics I	3
PHYS 1114	College Physics I Laboratory	1
PHYS 1118	College Physics II	3
PHYS 1119	College Physics II Laboratory	1
MATH 1111	College Trigonometry	3
MATH 2210	Calculus I (or higher)	4
PHIL 2290	History and Philosophy of Science	3
Total Hours		77

• University SLO: 1. Disciplinary Competence and Skills

Student Learning Outcome 5: Students will discuss biological relevance to societal issues

• University SLO: 7. Civic Engagement and Social Responsibility; 8. Stewardship

¹ Writing intensive courses.

In total, at least 18 hours of credit applied toward the major must be at the 3000-level or higher.

Objectives

Students who earn a B.A. in Biology will achieve the following student learning outcomes (SLO):

Student Learning Outcome 1: Students will demonstrate biological knowledge required in professional settings

• University SLO: 1. Disciplinary Competence and Skills

Student Learning Outcome 2: Students will use scientific evidence to communicate biological concepts

• University SLO: 3. Communication Skills

Student Learning Outcome 3: Students will use quantitative reasoning to solve biological problems

• University SLO: 2. Critical and Creative Thinking Skills; 5. Analytical Skills

Student Learning Outcome 4: Students will relate biological sciences with other natural, chemical, and mathematical sciences