Department of BIOLOGY & BIOCHEMISTRY

The Department of Biology & Biochemistry prepares students for careers in science and for a wide variety of professional schools, including graduate programs in biology, biochemistry, and the health professions, such as medical school, nursing, physician assistant, dental, chiropractic, pharmacy, and physical therapy. Biology and biochemistry exert more influence in our society than ever before, and the Department strives to be in the vanguard of an approach to education based on inquiry and critical thinking within the framework of a Christian worldview.

NOTE: WHEN A STUDENT RECEIVES A "U" GRADE FOR THE LAB PORTION OF A SCIENCE COURSE, HE/SHE RECEIVES CREDIT FOR THE COURSE, BUT THE COURSE DOES NOT COUNT FOR LABORATORY SCIENCE CREDIT IN CORE CURRICULUM.

Biochemistry Major Bachelor of Science

Biochemistry is the study of carbohydrates, proteins, lipids, nucleic acids and the processes of these molecules in the body. A rapidly developing and relatively new discipline within the sciences, biochemistry intersects with physiology, medicine, cell biology, genetics, etc. In recent years the pace of biochemical discovery has accelerated due to the profound transformation wrought by recombinant DNA technology. Biochemistry majors will be well prepared to enter the work force or pursue graduate degrees, medical school, or other professional training. The degree is granted upon completion of 125 credits as specified on pages 42–43 (40 credits must be in 3000- or 4000-level courses).

- **Natural World** courses in core curriculum: MAT2025 or MAT2121 (Note: If MAT2121 is taken, the elective in the major must be MAT2122); PHY1101/1101L or PHY1201/1201L.
- **Biochemistry majors** must receive a "C-" or better in all prerequisite courses. In addition, biochemistry majors must have a cumulative grade point average of at least 2.0 in all courses with BIO, CHE, and PHY prefixes in order to graduate.

Biochemistry Core . . . . . 48 cr

BIO1011	Principles of Biology I	4
BIO1012	Principles of Biology II	4
BIO3231	Biochemistry I	5
BIO3232	Biochemistry II	4
BIO3835	Career Competencies Seminar	1
BIO4359	Biotechnology Lab	2
BIO4835	Senior Seminar [**WCE, OCE**]	2
CHE1021	Principles of Chemistry I	4
CHE1022	Principles of Chemistry II	4
CHE3101	Organic Chemistry I	5
CHE3102	Organic Chemistry II	5
CHE3321	Physical Chemistry	4
PHY1102	Fundamentals of Physics II	4

Biochemistry Electives . . . . . 4 cr

Selected from courses with BIO (excludes BIO1009), CHE (excludes CHE1006), or MAT prefixes

WCE = WRITTEN COMMUNICATION EMPHASIS
OCE = ORAL COMMUNICATION EMPHASIS.
SEE PAGE 40 FOR EXPLANATION AND PREREQUISITES.

Biology Major Bachelor of Science

Through a sequence of core courses, the biology major provides students with a comprehensive study of the various sub-disciplines of biology including cell and molecular biology, genetics, organismal biology and ecology. Opportunities for research, independent study and practical internships further strengthen each student's degree and resume. The major is a flexible program designed to tailor fit to the career goals of each biology student. After completing the biology core requirements, students are able to select from a wide variety of science electives to prepare for any profession in the biological sciences: **Clinical Health Sciences** including medical, dental, veterinary, physician assistant, doctor of nurse practitioner, public health, physical therapy, chiropractic, etc.; **Research Sciences** including biomedical industry, MS and PhD programs in cell and molecular biology, plant and environmental science, forensic science, genetics etc. The degree is granted upon completion of 125 credits as specified on pages 42–43 (40 credits must be in 3000- or 4000-level courses).

- **Natural World** courses in core curriculum: MAT2025 or higher and PHY1101/1101L or higher.
- **Biology majors and minors** must receive a "C-" or better in all prerequisite courses. In addition, biology majors and minors must have a cumulative grade point average of at least 2.0 in all courses with BIO, CHE, and PHY prefixes in order to graduate.

Biology Core . . . . . 29 cr

BIO1011	Principles of Biology I	4
BIO1012	Principles of Biology II	4
BIO2113	Principles of Biology III	4
BIO3246	Genetics	5
BIO3835	Career Competencies Seminar	1
BIO4835	Senior Seminar **[WCE, OCE]**	2
CHE1021	Principles of Chemistry I	4
CHE3101	Organic Chemistry I & Lab	5

Biology Electives . . . . . 23 cr

Selected from courses with BIO prefixes (excludes BIO1009) and no more than four courses with CHE (excludes CHE1006), PHY, and MAT2055 or higher (excluding MAT2121).

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Biology Minor . . . . . 24 cr

Required Courses: BIO1011, BIO1012; CHE1021; twelve credits selected from courses with BIO prefix numbered higher than 1012.

Chemistry Minor . . . . . 22–23 cr

Required Courses: CHE1021, CHE1022, CHE3101; two courses selected from CHE3102, CHE3321, BIO3231, BIO3232.

Environmental Science Minor . . . . . 20 cr

Required Courses: BIO2113, BIO3175, SCI1010; eight credits selected from BIO2115, BIO2116, BIO3276, BIO3277, approved Topics courses, or faculty approved courses from Au Sable.

Science Minor . . . . . 20 cr

- **Natural World** courses in core curriculum must include MAT2025 or MAT2055 or higher and either BIO1011, CHE1021, or PHY1101.
- **Twenty credits** in courses with BIO, CHE, or PHY prefixes in addition to the Natural World science course requirement.

Environmental Science and Business Major BACHELOR OF SCIENCE

Full details are given under Multidisciplinary Studies. See page 122.

Health Sciences Major BACHELOR OF ARTS OR BACHELOR OF SCIENCE

The Health Sciences major is primarily intended for students who intend to pursue the Masters in Nursing, Masters in Physician Assistant, Doctor of Physical Therapy, Masters in Nutrition, Masters in Public Health, etc. The degree is granted upon completion of 125 credits as specified on pages 42–43 (40 credits must be in 3000- or 4000-level courses).

- **Natural World** courses in core curriculum: BIO1011 and MAT2055.
- **Social Science** course in core curriculum: SOC1035.
- **Philosophy** course in core curriculum: PHI2016
- **Health Sciences majors** must receive a "C-" or better in all prerequisite courses. In addition, Health Sciences majors must have a cumulative grade point average of at least 2.0 in all courses with BIO, CHE, HPE, and HSC prefixes in order to graduate.

Required Courses . . . . . 45 cr

BIO1025	Medical Terminology	2
BIO3145	Microbiology	4
BIO3157	Human Anatomy	4
BIO3158	Human Physiology	4
BIO3159	Pathophysiology	3
CHE1021	Principles of Chemistry I	4
CHE1022	Principles of Chemistry II	4
HPE3006	Human Nutrition	4
HSC4835	Senior Seminar for the Health Sciences **[WCE, OCE]**	2
HSC4995	Health Sciences Internship	2
PSY1005	Introduction to Psychology	4
PSY2108	Lifespan Psychology	4
PSY3207	Abnormal Psychology	4

Work experience as a Certified Nursing Assistant is highly recommended.

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Beta Beta Beta Biological Society

This prestigious National Biology Honors Society exists to provide educational and service opportunities to biology students. Membership is based upon sophomore class standing and earned GPA. Members plan and participate in society sponsored activities such as guest speakers, career round-table discussions, field trips, research presentations, community service and social gatherings.

Au Sable Institute (ASI)

Au Sable is an institution designed to promote Christian environmental stewardship through college courses, certification programs, internships, workshops, and conferences. Students may be eligible for courses, fellowships, and grants. Supported by the natural settings of the Great Lakes Forest of northern Michigan, participants take courses, engage in scholarship, gain field experience, confer, and develop practical tools for environmental stewardship in programs that take seriously both science and theology. See pages 183. See also Registered Programs at bestsemester.com for further information.