

# BIOLOGY B.S.

A degree in Biology is versatile and opens up many opportunities. A Biology degree provides a strong foundation in the natural sciences, and also prepares students for various careers such as lab technician at a research or medical institution, pharmaceutical or medical sales representative, or work in research and development for a biotech or a company.

Additionally, our Biology B.S. program satisfies the admission requirements of medical, dental, veterinary, physical therapy, pharmacy, and chiropractic schools, and provides a sound preparation for many graduate programs in the sciences.

The Biology B.S. degree requires a total of 44 hours in biology and 28 hours in related fields (chemistry, mathematics, and physics). It is expected that courses that have accompanying laboratory sections will be completed along with the lecture section. All Biology B.S. students must complete an internship, research project, or service-learning project, which is built into the BIO-499 Capstone Experience course.

## Pre-Medical/Pre-Dental/Pre-Veterinary/Pre-Health

Students interested in attending medical school, dental school, veterinary school, or other health programs should refer to the Pre-Medical/Pre-Dental/Pre-Veterinary/Pre-Health Advising Track (<https://catalog.dyouville.edu/degree-programs/arts-sciences-education/pre-med/>) page for more details.

## Pre-Physical Therapy: Biology B.S./Doctor of Physical Therapy (D.P.T.)

Students interested in a degree in Physical Therapy at D'Youville will matriculate into a sequential-degree program: B.S. in Biology + Doctor of Physical Therapy (D.P.T.) program (7 years). Entering freshmen matriculate into and complete a B.S. in Biology degree under the program administration of the Department of Natural Sciences and Mathematics. Upon completion of the B.S. in Biology, qualified graduate students then move directly into the 3-year Doctor of Physical Therapy program (D.P.T.). Refer to the Physical Therapy (<https://catalog.dyouville.edu/degree-programs/health-professions/wellness-and-rehabilitation-division/physical-therapy/physical-therapy-bs-dpt/>) page for more details.

## Pre-Chiropractic: Biology B.A. or B.S./Doctor of Chiropractic (D.C.)

Students interested in a Chiropractic degree at D'Youville will matriculate into a sequential-degree program: B.A. in Biology + Doctor of Chiropractic (D.C.) program (6.5 or 7.5 years), or B.S. in Biology + Doctor of Chiropractic (D.C.) program (7.5 years). Entering freshmen matriculate into and complete the undergraduate Biology degree under the program administration of the Department of Natural Sciences and Mathematics. Upon completion of the B.A. or B.S. in Biology, qualified graduate students then move directly into the 3.5-year Doctor of Chiropractic program (D.C.). Refer to the Chiropractic (<https://catalog.dyouville.edu/degree-programs/health-professions/wellness-and-rehabilitation-division/chiropractic-department/chiropractic-dc/>) page for more details.

Students within the Biology B.S. program must maintain a minimum 2.0 G.P.A. in courses taken at D'Youville in coursework required for their major. Students who fail to earn this G.P.A. will be placed on probation in the major. Probation may continue for a maximum of three consecutive semesters or a total of four non-consecutive semesters. Students who exceed these limits will be dismissed from the major. Students may

appeal these decisions on academic status by submitting, in writing, to the department chairperson, reasons why exceptional consideration may be justified.

If a student is dismissed from the Biology B.S. program due to poor performance in courses not required for the B.A. program, a student may have their record re-evaluated as a major in the B.A. program, and may be declared in good standing if their performance in the B.A. requirements justifies this.

## Pre-Medical/Pre-Dental/Pre-Veterinary/Pre-Health

This program offers motivated students the option to register for courses to fulfill the prerequisites for application to most medical, dental, veterinarian, and health-profession schools. The science emphasis includes two semesters of introductory biology, general chemistry, organic chemistry, and physics, and one semester of calculus. Students interested in attending medical school, dental school, veterinary school, or other health programs should refer to the Pre-Medical/Pre-Dental/Pre-Veterinary/Pre-Health Advising Track (<https://catalog.dyouville.edu/degree-programs/arts-sciences-education/pre-med/>) page for more details.

## Pre-Physical Therapy: Biology B.S./Doctor of Physical Therapy (D.P.T.)

Students choosing the sequential degree entry will complete their B.S. in Biology and move directly into the graduate D.P.T. program provided they complete all P.T. program prerequisites at a grade of B or better with a minimum prerequisite course G.P.A. of 3.20 as well as a cumulative G.P.A. of 3.0 and continue to meet all graduate admissions standards.

In addition to the courses required for the Biology B.S., students interested in Physical Therapy should also complete SOC-101, PSY-101, HP-203, BIO-107/L, BIO-108/L, and CHE-220/L (note: BIO-107 and BIO-108 lectures will substitute for the Biology B.S. requirement of BIO-305).

Refer to the Physical Therapy (<https://catalog.dyouville.edu/degree-programs/health-professions/wellness-and-rehabilitation-division/physical-therapy/physical-therapy-bs-dpt/>) page for more details.

## Pre-Chiropractic: Biology B.A. or B.S./Doctor of Chiropractic (D.C.)

Students choosing the sequential degree entry will complete their B.A. or B.S. in Biology and move directly into the graduate D.C. program provided they complete all Chiropractic program prerequisites at a grade of C or better and continue to meet all graduate admissions standards. Refer to the Chiropractic (<https://catalog.dyouville.edu/degree-programs/health-professions/wellness-and-rehabilitation-division/chiropractic-department/chiropractic-dc/>) page for more details.

## Course Requirements Biology B.S.

| Code                 | Title                                                                       | Credits    |
|----------------------|-----------------------------------------------------------------------------|------------|
|                      | General Education Requirements                                              | 30         |
|                      | Major Requirements                                                          | 72         |
|                      | Free electives (including remaining Liberal Arts and Sciences Requirements) | 18         |
| <b>Total Credits</b> |                                                                             | <b>120</b> |

**Course Requirements for the Biology B.S. Major  
In the Specific Areas of Concentration**

| Code                 | Title                                              | Credits   |
|----------------------|----------------------------------------------------|-----------|
| BIO-101              | Introductory Biology I                             | 4         |
| BIO-101L             | Intro Bio Lab I                                    | 0         |
| BIO-102              | Introductory Biology II                            | 4         |
| BIO-102L             | Intro Bio Lab II                                   | 0         |
| BIO-110              | Biology Seminar 1                                  | 1         |
| BIO-205              | Biodiversity I, Microbes, Protists, and Plants     | 4         |
| BIO-205L             | Biodiversity I, Microbes, Protists, and Plants Lab | 0         |
| BIO-206              | Biodiversity II                                    | 4         |
| BIO-206L             | Biodiversity II Lab                                | 0         |
| BIO-300              | Biology Seminar 2                                  | 1         |
| BIO-302              | Genetics                                           | 4         |
| BIO-302L             | Genetics Lab                                       | 0         |
| BIO-303              | Biochemistry <sup>1</sup>                          | 3         |
| BIO-303L             | Biochemistry Lab <sup>1</sup>                      | 1         |
| BIO-305              | Human Physiology <sup>3</sup>                      | 3         |
| BIO-306              | Ecology, Evolution & Behavior                      | 4         |
| BIO-306L             | Ecology, Evolution & Behavior Lab                  | 0         |
| BIO-312              | Molecular Cell Biology                             | 4         |
| BIO-499              | Capstone Experience <sup>2</sup>                   | 3         |
| <b>Total Credits</b> |                                                    | <b>40</b> |

<sup>1</sup> Denotes specific prerequisite coursework requiring a minimum grade of B and a G.P.A. of 3.20 to enter the D.P.T. graduate program. Of the four chemistry courses, only the best two must be considered for the prerequisite G.P.A.

<sup>2</sup> Capstone credits (3) are already counted under the General Education requirements.

<sup>3</sup> Human Physiology (BIO-305) can be substituted by one of the two following 6-credit sequences: either Human Anatomy & Physiology I (BIO-107) and Human Anatomy & Physiology II (BIO-108) or Advanced Physiology I (BIO-659) and Advanced Physiology II (BIO-660).

**Biology Electives Chosen from (4 credits)**

| Code     | Title                                                    | Credits |
|----------|----------------------------------------------------------|---------|
| BIO-217  | Animal Handling                                          | 3       |
| BIO-217L | Animal Handling Lab                                      | 1       |
| BIO-230  | Foundations of Environmental Science                     | 4       |
| BIO-230L | Foundations of Environmental Science                     | 0       |
| BIO-304  | Microscopic Anatomy                                      | 4       |
| BIO-304L | Microscopic Anatomy Lab                                  | 0       |
| BIO-309  | Virology                                                 | 3       |
| BIO-317  | Comparative Anatomy                                      | 4       |
| BIO-317L | Comparative Anatomy Lab                                  | 0       |
| BIO-320  | Developmental Biology                                    | 4       |
| BIO-320L | Dev Biology Lab                                          | 0       |
| BIO-332  | Environmental Health                                     | 3       |
| BIO-350  | Fundamentals of Genomics, Proteomics & Bioinformatics    | 3       |
| BIO-350L | Fundamentals Genomics, Proteomics and Bioinformatics Lab | 0       |
| BIO-389  | Special Topics                                           | 3-4     |
| BIO-389L | Special Topics Lab                                       | 1       |

|           |                                          |     |
|-----------|------------------------------------------|-----|
| BIO-390   | Special Topics                           | 3-4 |
| BIO-407   | Research at D'Youville                   | 1-3 |
| BIO-408   | Research At DYC                          | 1-3 |
| BIO-479   | Independent Study                        | 1-3 |
| BIO-480   | Independent Study                        | 1-3 |
| BIO-505   | Neurobiology                             | 4   |
| BIO-505L  | Neurobiology Lab                         | 0   |
| BIO-610   | Immunology                               | 3   |
| BIO-639   | Human Gross Anatomy                      | 6   |
| BIO-639L  | Human Gross Anatomy Lab                  | 0   |
| BIO-639XD | Human Gross Anatomy Extra Dissection Lab | 0   |
| BIO-659   | Advanced Physiology I                    | 3   |
| BIO-660   | Advanced Physiology II                   | 3   |

**In Other Academic Areas Required for the Major**

| Code                 | Title                                              | Credits   |
|----------------------|----------------------------------------------------|-----------|
| CHE-101              | General Chemistry I <sup>1</sup>                   | 3         |
| CHE-101L             | General Chemistry Laboratory <sup>1</sup>          | 1         |
| CHE-102              | General Chemistry II <sup>1</sup>                  | 3         |
| CHE-102L             | General Chemistry Laboratory II <sup>1</sup>       | 1         |
| CHE-219              | Organic Chemistry <sup>1</sup>                     | 3         |
| or CHE-209           | Principles of Organic Chemistry                    |           |
| CHE-219L             | Organic Chemistry Lab <sup>1</sup>                 | 1         |
| or CHE-209L          | Principles of Organic Chemistry Lab                |           |
| MAT-102L             | Mathematics in Biology: Models, Data and Relations | 1         |
| MAT-125              | Calculus I                                         | 4         |
| MAT-201              | Biostatistics <sup>2</sup>                         | 3         |
| PHY-101              | General Physics I <sup>1</sup>                     | 3         |
| or PHY-111           | Introduction to Physics                            |           |
| PHY-101L             | Gen Physics Lab I <sup>1</sup>                     | 1         |
| or PHY-111L          | Introduction to Physics Lab                        |           |
| PHY-102              | General Physics II <sup>1</sup>                    | 3         |
| or PHY-112           | Introduction to Physics                            |           |
| PHY-102L             | Gen Physics Lab II <sup>1</sup>                    | 1         |
| or PHY-112L          | Introduction to Physics Lab                        |           |
| <b>Total Credits</b> |                                                    | <b>28</b> |

<sup>1</sup> Denotes specific prerequisite coursework requiring a minimum grade of B and a G.P.A. of 3.20 to enter the D.P.T. graduate program. Of the four chemistry courses, only the best two must be considered for the prerequisite G.P.A. Pre-professional (pre-med and pre-dent) need to take Organic Chemistry (CHE-219) and lab followed by Organic Chemistry II (CHE-220) and lab as required by most medical schools.

<sup>2</sup> The statistics requirement can also be satisfied by MAT-123.

**Course Requirements for the Biology B.S. Major for  
Health Professions Preparation (D.P.T)**

| Code | Title                                     | Credits |
|------|-------------------------------------------|---------|
|      | General Education Requirements            | 30      |
|      | Major Biology B.S. and D.P.T. preparation | 71      |
|      | Health Professions option (D.P.T.)        | 13      |

|                                                                             |   |
|-----------------------------------------------------------------------------|---|
| Free electives (including remaining Liberal Arts and Sciences Requirements) | 6 |
|-----------------------------------------------------------------------------|---|

**Total Credits 120**

### Course Requirements for the Biology B.S. Major (Pre DPT)

| Code                 | Title                                              | Credits   |
|----------------------|----------------------------------------------------|-----------|
| BIO-101              | Introductory Biology I                             | 4         |
| BIO-101L             | Intro Bio Lab I                                    | 0         |
| BIO-102              | Introductory Biology II                            | 4         |
| BIO-102L             | Intro Bio Lab II                                   | 0         |
| BIO-107              | Human Anatomy & Physiology I <sup>1,2</sup>        | 3         |
| BIO-108              | Human Anatomy & Physiology II <sup>1,2</sup>       | 3         |
| MAT-102              | Mathematics in Biology: Models, Data and Relations | 1         |
| MAT-201              | Biostatistics <sup>1</sup>                         | 3         |
| BIO-110              | Biology Seminar 1                                  | 1         |
| BIO-205              | Biodiversity I, Microbes, Protists, and Plants     | 4         |
| BIO-205L             | Biodiversity I, Microbes, Protists, and Plants Lab | 0         |
| BIO-206              | Biodiversity II                                    | 4         |
| BIO-206L             | Biodiversity II Lab                                | 0         |
| BIO-300              | Biology Seminar 2                                  | 1         |
| BIO-302              | Genetics                                           | 4         |
| BIO-302L             | Genetics Lab                                       | 0         |
| BIO-303              | Biochemistry                                       | 3         |
| BIO-303L             | Biochemistry Lab                                   | 1         |
| BIO-306              | Ecology, Evolution & Behavior                      | 4         |
| BIO-306L             | Ecology, Evolution & Behavior Lab                  | 0         |
| BIO-312              | Molecular Cell Biology                             | 4         |
| BIO-499              | Capstone Experience <sup>3</sup>                   | 1         |
| MAT-125              | Calculus I                                         | 4         |
| PHY-101              | General Physics I                                  | 3         |
| or PHY-111           | Introduction to Physics                            |           |
| PHY-101L             | Gen Physics Lab I                                  | 1         |
| or PHY-111L          | Introduction to Physics Lab                        |           |
| PHY-102              | General Physics II                                 | 3         |
| or PHY-112           | Introduction to Physics                            |           |
| PHY-102L             | Gen Physics Lab II                                 | 1         |
| or PHY-112L          | Introduction to Physics Lab                        |           |
| CHE-101              | General Chemistry I                                | 3         |
| CHE-101L             | General Chemistry Laboratory                       | 1         |
| CHE-102              | General Chemistry II                               | 3         |
| CHE-102L             | General Chemistry Laboratory II                    | 1         |
| CHE-219              | Organic Chemistry                                  | 3         |
| CHE-219L             | Organic Chemistry Lab                              | 1         |
| <b>Total Credits</b> |                                                    | <b>69</b> |

<sup>1</sup> Denotes specific prerequisite coursework requiring a minimum grade of B and a G.P.A. of 3.20 to enter the D.P.T. graduate program. Of the four chemistry courses, only the best two must be considered for the prerequisite G.P.A.

<sup>2</sup> In the BIO-BS for pre-health, Human Anatomy & Physiology I (BIO-107) and Human Anatomy & Physiology II (BIO-108) substitute for Human Physiology (BIO-305).

<sup>3</sup> Capstone Experience Credits (3) already counted under General Education Requirements.

### In Other Academic Areas Required for the Major for DPT

| Code                 | Title                                 | Credits   |
|----------------------|---------------------------------------|-----------|
| SOC-101              | Principles of Sociology <sup>1</sup>  | 3         |
| PSY-101              | General Psychology <sup>1</sup>       | 3         |
| HP-203               | Medical Terminology                   | 1         |
| BIO-107L             | Human Anatomy & Physiology Laboratory | 1         |
| BIO-108L             | Human Anatomy & Physiology II Lab     | 1         |
| CHE-220              | Organic Chemistry II                  | 3         |
| CHE-220L             | Organic Chemistry II Lab              | 1         |
| <b>Total Credits</b> |                                       | <b>13</b> |

<sup>1</sup> Denotes specific prerequisite coursework requiring a minimum grade of B and a G.P.A. of 3.20 to enter the D.P.T. graduate program. Of the four chemistry courses, only the best two must be considered for the prerequisite G.P.A.

Admission into the B.S. in Biology requires 1) three years of high school Math, English, History, and Science, 2) a high school average of 85% or a 3.0 on a four-point scale or a transfer G.P.A. of 2.5, and, 3) a high school science G.P.A. above 80%. The same admissions requirements exist for the Biology B.S. pre-Medical/pre-Dental/pre-Veterinary/pre-Health and pre-Chiropractic tracks. Admission into the Biology B.S./Physical Therapy (D.P.T.) track has the same admissions requirements, but a transfer G.P.A. of 3.0 is required.

Students nearly meeting these requirements will be considered for these programs by the department. Students denied immediate acceptance into the Biology B.S. will be accepted into the Biology B.A. program if they meet its requirements. These students may be promoted into the Biology B.S. program after they have sufficiently demonstrated competence (usually after the completion of two semesters).

The B.S. in Biology allows graduates to the workforce as lab technicians, medical or pharmaceutical sale representatives, and high school educators (an education masters might be required for the latter). In addition, this major is excellent for students preparing for graduate school as well as for professional programs in medicine, veterinary medicine, dentistry, physician assistant, physical therapy, podiatry, optometry, chiropractic, and pharmacology.