

FIFTH YEARS MASTERS PROGRAMS IN THE DIVISION

Some Graduate Programs in the Division of Biology and Medicine at Brown University offer a Fifth Year Masters program for students completing a Bachelors degree in one of the approved concentrations in the Program in Biology. The combined program of course work, independent research, and Masters Thesis leads to a Master of Science (or in some cases, Master of Arts) degree in Biology.

Individual programs are offered in these areas, and are described in turn and linked below.

- [MOLECULAR BIOLOGY, CELL BIOLOGY AND BIOCHEMISTRY](#)
- [BIOMEDICAL ENGINEERING](#)
- [ARTIFICIAL ORGANS, BIOMATERIALS AND CELLULAR TECHNOLOGY](#)
- [ECOLOGY AND EVOLUTIONARY BIOLOGY](#)
- [PATHOBIOLOGY](#)
- [PUBLIC HEALTH](#)

FIFTH YEARS MASTERS PROGRAMS IN THE DIVISION

Five Year Integrated Baccalaureate-Masters Program Molecular Biology, Cell Biology and Biochemistry

The Molecular Biology, Cell Biology and Biochemistry Graduate Program (MCBGP) offers a five year bachelors/masters degree program leading to either Master of Arts or Master of Science degrees in Biology. The program is designed to develop high-level knowledge in key areas of modern biological science, notably Molecular Biology and Genetics, Cell Biology, Biochemistry and Developmental Biology. Students will gain skill in reading and analyzing primary research literature, making and testing experimental hypotheses, designing potential research programs, and public presentations of papers and experimental data. The knowledge and skills learned in this program should be applicable to those interested in biotechnology-based laboratory research, businesses related to biotechnology, teaching, and intellectual property law.

Students will complete at least eight (8) courses in MCBGP related areas. Part of this requirement involves demonstrating skill and knowledge in the MCBGP core disciplines of Molecular Biology and Genetics, Cell Biology, Biochemistry and Developmental Biology. Usually, this will involve taking BIOL 2030 Foundations for Advanced Study in Experimental Biology. Students may further augment their knowledge and skill by taking the related courses of Molecular Genetics (BIOL 2540), Advanced Cell Biology (BIOL 2050), Advanced Biochemistry (BIOL 2270) and Analysis of Development (BIOL 2310).

Students will also take at least two approved 2000-level graduate seminars in MCBGP related areas.

As part of completing the eight-course requirement, students seeking an MS will conduct two semesters of graduate level research (BIOL 2950 and BIOL 2960) in the laboratory of an MCBGP faculty member and write, present and publicly defend a thesis on this work. Those seeking MA degrees will meet the eight-course requirement largely or completely with classroom-based courses.

Students may use two courses taken during their undergraduate career at Brown to satisfy part of the course enrolment criteria as long as these two courses are approved by the MCBGP and as long as these courses were not already used to meet an undergraduate degree requirement. For example, students could count up to two of BIOL 1050 Advanced Cell Biology, BIOL 1270 Advanced Biochemistry, BIOL 1310 Analysis of Development, or BIOL 1540 Molecular Genetics taken as an undergraduate toward their Masters degree course requirement as long as the courses were not already used to satisfy an undergraduate concentration requirement.

Students interested in this program are strongly urged to contact the MCBGP as early as the start of their junior year.

http://www.brown.edu/Departments/Molecular_Biology/Grad_Program/index.php?page=5thYearMasters&s=1

FIFTH YEARS MASTERS PROGRAMS IN THE DIVISION

Fifth Year Master of Science in Biomedical Engineering

The Graduate Program in Biomedical Engineering is a joint program of the Division of Engineering and the Division of Biology and Medicine that offers advanced training appropriate for careers in academia or industry in the field of biomedical engineering.

Students graduating with an ScB and who fulfill the concentration requirements for biomedical engineering are eligible to apply for the fifth-year Sc.M. program, wherein a student may earn the Sc.M. within one year of study.

1. 5-year Baccalaureate/Masters open only to Brown students.
2. Must meet or exceed requirements for undergraduate concentration in biomedical engineering at Brown.
3. Do not have to take GREs.
4. Must apply for integrated program before completion of undergraduate studies.
5. Must choose a Brown faculty member to be thesis advisor before start of the program.
6. Student fills out application form (<http://gradschool.brown.edu/go/5thyear>) and suggests a proposed curriculum.
7. A minimum of eight tuition units (e.g., eight (8) courses, not more than three of which are for thesis research) are required for Masters degree.
8. Must take an approved set of courses, at least five structured (not seminar, not independent study) advanced-level (1000 or 2000) biology and engineering courses, at least two in biology and at least two in engineering.
9. Must receive a grade of B or better, courses must be taken for a grade rather than credit/no credit.
10. A maximum of two advanced level courses taken during senior year can be applied towards Masters degree as long as they are not used towards fulfillment of undergraduate concentration.
11. Program Director and thesis advisor endorse the student's proposed curriculum.
12. Student forwards endorsed abbreviated Graduate application, undergraduate concentration form, internal academic record and two letters of recommendation to Graduate School.
13. One of the two letters of recommendation must be from a Brown faculty accepting the student into his/her lab (thesis advisor) with a strong commitment to act as the student's mentor.
14. Submit final thesis, present work as a seminar and pass final oral examination by Thesis Committee.

<http://www.engin.brown.edu/undergrad/guide/5yearmasters.htm>

FIFTH YEARS MASTERS PROGRAMS IN THE DIVISION

5th YEAR MASTERS Program In Artificial Organs, Biomaterials & Cellular Technology

The Graduate Program in Artificial Organs, Biomaterials & Cellular Technology offers advanced training appropriate for academic and research careers in fields of biology, natural science, and medical sciences that include cellular, molecular, comparative, drug delivery, and tissue engineering.

The following list is an overview of the requirements for the Masters Degree in Artificial Organs, Biomaterials and Cellular Technology. For more specific details, please refer to the Graduate Program Guidelines.

1. 5th Year Baccalaureate/Masters open only to Brown students.
2. Do not have to take GREs.
3. Must apply for integrated program before completion of undergraduate studies.
4. Must choose a Brown faculty member to be thesis advisor before start of the program.
5. Student fills out application form (<http://gradschool.brown.edu/go/5thyear>) and suggests a proposed curriculum.
6. A minimum of eight tuition units (e.g., eight (8) courses, not more than three of which are for thesis research) are required for Masters degree.
7. Must take an approved set of courses, at least five structured (not seminar, not independent study) advanced-level (1000 or 2000) courses.
8. Must receive a grade of B or better, courses must be taken for a grade rather than credit/no credit.
9. A maximum of two advanced level courses taken during senior year can be applied towards Masters degree as long as they are not used towards fulfillment of undergraduate concentration.
10. Program Director and thesis advisor endorse the student's proposed curriculum.
11. Student forwards endorsed abbreviated Graduate application, internal academic record, and two letters of recommendation to Program for a recommendation for admission. The application will then be forwarded to the Bio Med Graduate Postdoc Affairs office for approval. The completed application will then be sent to the Graduate School for final processing.
12. One of the two letters of recommendation must be from a Brown faculty accepting the student into his/her lab (thesis advisor) with a strong commitment to act as the student's mentor.
13. For a Master of Science degree, the student must submit final thesis, present work as a seminar and pass final oral examination by Thesis Committee.

Thesis Committee

Thesis advisor
One Brown faculty from brown

ABC Graduate Program Director

Edith Mathiowitz, Ph.D.
Professor of Medical Science and Engineering

FIFTH YEARS MASTERS PROGRAMS IN THE DIVISION

Fifth Year Masters Program in Ecology and Evolutionary Biology

The Graduate Program in Ecology and Evolutionary Biology at Brown University offers a Fifth Year Masters program for students completing a Bachelors degree in one of the approved concentrations in the Program in Biology. The combined program of course work, independent research, and Masters Thesis leads to a Master of Science degree in Biology.

The goal of the program is to allow students to build a stronger foundation of courses in a selected topic area, to concentrate on a research project that will lead to a Masters thesis, and to develop skills as an independent researcher in the area of ecology and evolutionary biology. The goals are not simply to extend the course work taken as an undergraduate. Rather, students should identify an integrated set of courses that will enhance their knowledge, and propose an independent research project that will be carried out in close supervision with a faculty mentor in the EEB Graduate Program.

Students are required to complete four courses each semester, for a total of eight courses. Two of these courses are considered foundation courses that extend their undergraduate training, one course will be the EEB graduate seminar (BIOL 2430, 2440), and one course will be graduate independent research (BIOL 2980, 2990). The nature of the two foundation courses will be tailored to each student depending on their undergraduate transcript and the goals of their research project. Courses in statistics or computer science are strongly recommended. Students may use two of their undergraduate science courses to meet the course requirements listed above, with the following stipulations. Students graduating with an A.B degree may use two courses provided that neither of these courses was used to complete their A.B. program. Students graduating with an Sc.B. may use two courses from their undergraduate science courses, one of which may have been used to complete 'Thematic Cluster' of advanced courses for the Sc.B. concentration. For example, if a student completed a B.A. in Biology and took Marine Biology (BIOL1440) and Evolutionary Genetics (BIOL 1410), but did not need either course for any aspect of the degree requirements, both courses can count toward 5th Year Masters course credit. An Sc.B. concentrator who, for example, use used BIOL 1410 Evolutionary Genetics as part of their Thematic Cluster, and had one additional course that was not needed for any aspect of the Sc.B. degree could apply both of these courses to the 5th year Masters foundation course requirements.

These adjustments for the course requirements are designed so that 5th year Masters students can focus the majority of their time the research plan developed in collaboration with the designated faculty mentor. In many cases, the 5th year Masters program will help a student develop their undergraduate thesis project into a more complete, ideally publishable, form. The nature of this research should be stated clearly in the Application, as part of the Personal Statement that is required on the Application. In addition, the applicant should provide two (2) recommendations to be completed, using the designated Graduate School forms. One of these recommendations should be from the proposed faculty mentor. All application materials should be reviewed and approved by the Director of Graduate Studies (David_Rand@brown.edu) before submitting the application.

FIFTH YEARS MASTERS PROGRAMS IN THE DIVISION

CONCURRENT/COMBINED PROGRAM LEADING TO BACCALAUREATE AND MASTERS DEGREES IN PATHOBIOLOGY

Requirements for the concurrent/combined degrees:

Brown undergraduate students completing courses listed below will fulfill the requirements for the Masters of Arts Degree in Pathobiology. Six of the eight courses required for the Masters degree must be 100-200-level not used towards the undergraduate degree. The remaining two courses must be at the 100 level or above and may not be course credit for Independent research projects or undergraduate thesis work. A grade of B or better is required in all courses. At least two of the courses taken must be from one of the three thematic areas.

With prior approval of the curricular plan by the Graduate Program and enrollment in the concurrent/combined program, the student will be awarded the baccalaureate and Masters Degree upon graduation.

Students are not required to serve as Teaching Assistants as part of this program.

This program is open only to Brown University undergraduates.

Course Selection:

a. Required Course: BIOL 1860

b. Select at least two of the following. BIOL 1540 / BIOL 2540, BIOL 1050 / BIOL 2050, BIOL 1270/2270, BIOL 2200, BIOL 2210, BIOL 2280, BIOL 1310 / BIOL 2310

c. Focus Area Courses – Select at least two courses from one of the three thematic areas.

- Additional coursework from the other thematic areas is permitted.

Thematic area 1: Cancer Biology

BIOL 1290, BIOL 2820, BIOL 2830*, BIO 2840*, BIOL 1870

Thematic area 2: Immunology and Infection

BIOL 1520, BIOL 1560, BIOL 1600, BIOL 2830*, BIOL 2840*

Thematic area 3: Toxicology and Environmental Pathology

BIOL 1830, BIOL 2820, BIOL 2830*, BIOL 2804*, BIOL 1870

* BIOL 2830 and BIOL 2840 are Special Topics courses whose topics and content rotate between the three thematic areas. Some topics are taught only once every 1–2 years and therefore advanced planning is required.

If needed, additional courses may be chosen from the following: BIOL 1100, BIOL 1120, BIOL 2170, BIOL 1080 or other coursework with pre-approval by the Graduate Program Directors.

INTEGRATIVE FIVE-YEAR BACCALAUREATE AND MASTERS DEGREES IN PATHOBIOLOGY

Requirements for the Integrative 5-year degree program:

Brown undergraduate students, at the start of their last undergraduate semester, may apply to the Graduate Council for admissions to the Integrative five-year Baccalaureate-Masters Degree program in Pathobiology. The student is expected to complete a minimum of eight graduate courses from the course list below. No more than two of these courses may be taken during the undergraduate years and they may not be used to fulfill the concentration requirements of the undergraduate degree. One of the eight courses must be BIOL 1860 (Pathology) and two must be at the 2000-level. At least two of the courses taken must be from one of the three thematic areas.

It is expected that all coursework will be completed in no more than the two semesters immediately following the undergraduate years. Students successfully completing the required graduate coursework with a grade of B or better will be awarded a Masters of Arts degree in Pathobiology upon graduation.

Depending on previous experience, students may be required to serve as Teaching Assistants in order to fulfill the requirements of the Integrated Degree Program.

This program is open only to Brown University undergraduates.

FIFTH YEARS MASTERS PROGRAMS IN THE DIVISION

Course Selection:

- a. Required Courses: BIOL 1860 and BIOL 2850
- b. Select at least two of the following. BIOL 1540 / BIOL 2540, BIOL 1050/ 2050, BIOL 1270/2270, BIOL 2200, BIOL 2210, BIOL 2280, BIOL 1310 /BIOL 2310, BIOL 2320
- c. Focus Area Courses – Select at least two courses from one of the three thematic areas.
- Additional coursework from the other thematic areas is permitted.

Thematic area 1: Cancer Biology

BIOL 1290, BIOL 2820, BIOL 2830*, BIOL 2840*, BIOL 1870

Thematic area 2: Immunology and Infection

BIOL 1520, BIOL 1560, BIOL 1600, BIOL 2830*, BIOL 2840*

Thematic area 3: Toxicology and Environmental Pathology

BIOL 1830, BIOL 2820, BIOL 2830*, BIOL 2840*, BIOL 1870

* BIOL 2830 and BIOL 2840 are Special Topics courses whose topics and content rotate between the three thematic areas. Some topics are taught only once every 1–2 years and therefore advanced planning is required.

If needed, additional courses may be chosen from the following: BIOL 1100, BIOL 1120, BIOL 2170, BIOL 1080 or other coursework with pre-approval by the Graduate Program Directors.

FIFTH YEARS MASTERS PROGRAMS IN THE DIVISION

The Five year AB/MPH Joint-Degree Program in Public Health

The program intends to improve population health through:

- * research on factors affecting population patterns of disease and injury as well as on factors promoting health and well-being,*
- * the education of future generations of health researchers and policy makers,*
- * public service by translating research into effective public policy.*

The degree integrates academic, research, and public service programs relevant to population health with links across the Medical School and University academic departments as well as University-based and Hospital-based research centers. The Program in Public Health also provides a critical connection between Brown University and local, state, national governmental, public, and private health entities.

Admission

The 5-year AB/MPH Degree is a rigorous program in professional public health education. As undergraduates in the AB/MPH program, students concentrate in Community Health, must qualify for the Honors Track and successfully complete an Honors Thesis.

Students can apply to the AB/MPH program in the second semester of their sophomore year or during their junior year. Application to the AB/MPH is done through the Graduate School, with review done by the MPH Admissions Committee.

Review by the Admissions Committee of the AB/MPH Program requires not only Honors Track eligibility and the Graduate School application package, but also:

- * three letters of recommendation, with at least one from Community Health faculty;*
- * a personal statement regarding reasons for interest in the program;*
- * evidence of commitment to public health through previous course work, independent study, employment and/or volunteer experience;*
- * transcripts from all undergraduate, graduate, medical or other professional schools attended.*

Applications will be reviewed on a rolling basis from January through May.

Ongoing evaluation of student performance in Semesters 5 - 8 will determine continuation in the program. Entrance into the fifth year of the AB/MPH Program can only occur after students complete the requirements for the baccalaureate degree and if they have maintained their Honors status in the concentration. Graduate level courses in the fifth year lead to the Masters thesis and completion of the MPH degree.

<http://med.brown.edu/commhealth/ab>