

# **The Biology Majors' Guidebook**

**2022-23**

**Department of Biology  
Oberlin College**

## Checklist of Biology Major Requirements

### A. Three core courses:

- BIOL 100 (includes lab)  
 BIOL 200 (includes lab)  
 BIOL 213 (includes lab)

### B. Two post-core Biology Department courses:

Two 200-, 300- or 400-level full courses (exclusive of the core) offered by the Oberlin College Biology Department; at least one must have an associated lab component.

- BIOL \_\_\_\_\_ (with lab)  
 BIOL \_\_\_\_\_

### C. Two additional post-core life sciences courses:

The equivalent of two full courses from among any of the following courses. However, no more than two courses from outside the Oberlin Biology Department may be counted.

- a) 200-, 300-, or 400-level BIOL courses \_\_\_\_\_  
 b) 200- or 300-level NSCI courses \_\_\_\_\_  
 c) ENVS 316 (Ecosystems Ecology) or ENVS 340 (Systems Modeling: Systems Thinking)  
 d) CHEM 374 (Biochemistry)  
 e) GEOL 320 (Paleontology)  
 f) BIOL 501 or 502 (the equivalent of one full-course may be applied to the major).  
 g) post-introductory transfer credits (the equivalent of 2 full courses may be applied, with consent of the chair of the department; *it is recommended that you obtain pre-approval from the chair—please see important guidance on page 20*)

**Note: Coursework from Categories B and C must collectively provide at least 2 lab experiences.**

### D. Four courses in affiliated sciences:

- CHEM 101 and 102 (or AP/IB equivalent; CHEM 103 may substitute for CHEM 101/102)  
 CHEM 205  
 One course from the following: MATH 132, 133, or 134; STAT 113 or 114; CHEM 254; PHYS 103 or 110; PSYC 200; CSCI 140 or 150; any 200 or 300 level MATH, STAT, or CSCI class

### Other important considerations:

1. At least 3.5 full biology courses from categories A, B, and C, including two full courses (or the equivalent) of post-core coursework, must be taken at Oberlin.
2. Post-core coursework taken outside the Oberlin Biology Department and applied to the major may not exceed the equivalent of two full courses, and must have approval from the chair. See page 20 for more details.
3. Private Readings, FYS, Colloquia, Practicums, or courses with course numbers below 100 do not count toward the major.
4. Students may not receive both academic credit and financial compensation for the same research work.
5. A minimum grade of C- (or CR or P) must be earned for any eligible course to count toward the major.

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## The Biology Major

### The biology major at Oberlin has three learning goals:

- 1) Graduates will have knowledge of key biological concepts and underlying fundamentals and should be able to apply these across all levels of organization.
- 2) Graduates will have critical thinking and functional skills needed to carry out the scientific process from inception through communication of results.
- 3) Graduates will have an understanding of the ways in which biology interrelates with other sciences, disciplines, and society.

Many biology majors proceed to study and work in the life sciences, including fundamental research and applied fields such as medicine and allied health careers, conservation biology, science writing, veterinary medicine, and teaching. By a proper selection of biology and other science courses in consultation with a departmental advisor, a student majoring in biology can prepare for graduate study in a wide range of areas such as animal behavior, biochemistry, biophysics, botany, cell biology, ecology, conservation biology, developmental biology, environmental sciences, evolutionary biology, forestry, genetics, genetic counseling, genomics, immunology, marine biology, molecular biology, morphology, microbiology, mycology, parasitology, physiology, plant biology, public health, systematics, systems biology, translational medicine, virology, and wildlife biology.

### Requirements for the Major

Students declaring the major in Biology must comply with the course requirements in effect in the most recent edition of the College Catalog (<https://catalog.oberlin.edu/>) at the time the student declares the major. A checklist of the courses required for the Biology major are also located inside the front cover of this guidebook. With planning, the eleven courses needed to fulfill the major may be easily completed in three years. This allows flexibility for students in their paths through the major, as described below.

Many students experience a more successful college transition by beginning with only a single lab science course in the first semester. If you are eager to enroll in introductory biology and have a strong science background, you may choose to register for both BIOL 100 and CHEM 101 in the first semester. Both classes have a lab, however, so if you have any doubts about taking both courses in your first semester, be sure to consult with your advisor. Some students choose to take CHEM 101 and a mathematics or statistics course in the first semester, delaying BIOL 100 to the second semester. Alternatively, some students elect to take BIOL 100 as their only lab course in the fall semester. Please note, however, that the two-semester introductory chemistry series may be started only in the fall semester, whereas BIOL 100 may be taken in either semester.

Other courses required of all Biology majors include BIOL 200 (Genetics, Evolution, and Ecology) and BIOL 213 (Molecular Biology, Cell Biology, and Biochemistry), both of which also have labs. Beyond these courses and the required Chemistry courses, students may choose from a number of courses in Biology and other departments to complete the major. Examples of various pathways through the major and associated information are located on pages 15-18 of this guidebook. Your academic advisor and/or Biology faculty (if you are not a declared major) are also excellent resources to help you plan your path through the major.

### Advanced Placement

Students earning a score of 4 or 5 on the Advanced Placement Biology exam (AP Bio) or a score of 6 or 7 on the International Baccalaureate Biology Higher Level exam will receive 1 full course of natural science credit, as BIOL 604, applied toward graduation requirements, but not toward the Biology major. AP or IB credit does not exempt Biology majors from taking BIOL 100: Organismal Biology.

### Faculty Advisors

Biology majors are required to have an advisor from among the continuing Biology faculty. However, you may opt for a biology advisor prior to declaring a major, and you may seek advice from professors who are not your official advisor. All professors maintain regular office hours and can be contacted by email. The department chair maintains regular office hours (posted on the departmental website) and is available to discuss the major or other needs. Students interested in pre-health or veterinary career paths should contact the pre-health advisor, Maureen Peters ([mpeters@oberlin.edu](mailto:mpeters@oberlin.edu)).

### Courses for the Major

The complete list of courses accepted for satisfaction of the major in biology is available in the current Oberlin College Course Catalog (<https://catalog.oberlin.edu/>). Introduction to Global Health (BIOL 035), Environmental Biology (BIOL 103), first-year seminars, and other courses numbered below 100 *do not* count toward the major.

The three required core courses, Organismal Biology (BIOL 100), Genetics Evolution and Ecology (BIOL 200), and Molecular Biology, Cell Biology, and Biochemistry (BIOL 213) are offered every semester.

The following upper-level biology courses are typically offered once per year or every other year, though with some gaps when a faculty member is on sabbatical (check the current year's Class Schedule to confirm whether a course is being offered in a given year). All 200-level BIOL courses require BIOL 100 as a prerequisite, except BIOL 202, which also allows BIOL 103 as a prerequisite. 300- and 400-level BIOL classes require either BIOL 200 or BIOL 213 as a prerequisite, with some limited exceptions (check the Course Catalog for details).

#### *Current list of upper-level Biology courses\**

BIOL 202 – Plant Ecology (includes lab)  
 BIOL 234 – Human Anatomy (includes lab)  
 BIOL 235 – Essentials of Epidemiology (includes lab)  
 BIOL 307 – Microbiology  
 BIOL 312 – Physiology (includes lab)  
 BIOL 318 – Evolution  
 BIOL 321 – Plant Biology (includes lab)  
 BIOL 322 – Genetics of Populations (includes lab)  
 BIOL 323/324 – Plant Systematics + Lab  
 BIOL 330 – Genetic Analysis  
 BIOL 335 – Mycology (includes lab)  
 BIOL 336 – Genomics (includes lab)  
 BIOL 337 – Immunity and Pathogenesis  
 BIOL 340 – Eukaryotic Cell Culture Laboratory  
 BIOL 403 – Seminar: The Cell and Molecular Biology of Pathogen-Host Interactions  
 BIOL 407 – Seminar: Origin(s) of Life  
 BIOL 408 – Seminar: Experimental Evolution  
 BIOL 411 – Seminar: Conservation Biology  
 BIOL 417 – Seminar: Why Humans Aren't Immortal: Molecular Mechanisms of Aging  
 BIOL 423 – Seminar: Biogeography

\*Please note that not all of these courses may be offered every year due to faculty leaves and faculty turnover. It is always best to check the current version of the Oberlin course catalog and/or with Biology faculty to determine whether a specific course will be offered during a specific academic year.

### Transfer Credit

A limited amount of transfer credit may be applied to the major. Specifically, the equivalent of 2 full courses of upper-level credit (i.e., beyond the core sequence of BIOL 100, BIOL 200, and BIOL 213) may be applied, with consent of the chair of the department for each course to be transferred. It is highly recommended that you seek pre-approval for transfer credit from the current chair prior to enrolling in the courses you wish to transfer for credit. Further guidelines for granting transfer credit are available on page 20. In unusual circumstances, it might be possible to transfer credit for one of the three core courses, but students should consult with the chair for further guidance.

### Private Readings

Private Readings (BIOL 995) are arranged with individual faculty members. Many private-reading topics are similar to winter-term topics listed under the appropriate professors' names on pages 6 and 9-10 of this guidebook. Private readings are intended to supplement completed coursework, and should NOT overlap with or replace existing courses except under special circumstances. Approval for Private Readings requires signatures of the faculty sponsor, your academic advisor, and the department chair. Private Reading credits do not count toward the major, but they may count toward graduation. See the current Course Catalog for more details regarding Private Reading.

### Non-Majors Biology Courses

The introductory course, BIOL 100 (Organismal Biology), has no prerequisite and is open to non-majors. In addition, several first-year seminars are taught with a biological emphasis or scientific theme. Introduction to Global Health (BIOL 035) and Environmental Biology (BIOL 103), are available to non-majors.

### Other Opportunities

**Winter-Term Projects.** Continuing biology faculty members sponsor winter-term projects representing various areas in biology. Group projects are announced well in advance of the coming Winter Term. Students intending to conduct individual winter-term projects are urged to confer as soon as possible with the appropriate faculty sponsor to ascertain the professor's availability.

- |                   |   |
|-------------------|---|
| Taylor Allen:     | Exploration of research on learning and equity in education; readings in Old Icelandic and Old English; qualitative research projects on resilience and wellbeing.  |
| Jane Bennett:     | Intensive science review, pre-medical, dental, veterinary and health career internships. Research internships.  |
| Katherine Cullen: | Readings and review of molecular and cell biology, genetics, microbiology, and reproductive biology literature. Research internships or career explorations.  |
| Aaron Goldman:    | Projects involving protein and proteome evolution with a special focus on early cellular life and the emergence of ancient metabolic systems.   |
| Marta Laskowski:  | Projects and readings in plant growth and development.  |
| Roger Laushman:   | Projects involving conservation biology, forest ecology, and invasive species.  |
| Mike Moore:       | Projects involving plant evolution/systematics, including biological collections, molecular systematics, phylogeography, etc.   |
| Maureen Peters:   | Laboratory studies of biological rhythms, nutrition, and aging in the nematode, <i>Caenorhabditis elegans</i> using a variety of genetic, cellular and physiological techniques. Readings in clinical and molecular genetics, health careers, molecular biology, cancer biology, and the history of medicine, genetics, and eugenics. |
| Angie Roles:      | Projects and readings in molecular ecology, population and quantitative genetics, evolutionary biology and conservation/invasion biology. Readings in inclusion in science education and importance of mental well-being in learning in STEM.   |
| Laura Romberg:    | Projects involving the biochemistry of proteins involved in bacterial cell division; independent projects on food science.  |

**Summer Courses.** Up to two courses offered during the summer at various institutions and biological field stations may be accepted toward general or major credit, but only by approval (pre-approval recommended) of the Department Chair (currently Prof. Mike Moore). The Department provides a limited number of competitive scholarships to support coursework at marine and inland biological field stations. Interested students are strongly advised to consult with their advisors and the Chair regarding participation in such off-campus programs. Further information on summer courses is posted on bulletin boards in the Department and at <http://www.obfs.org/>.

Applications for Department Scholarships are due in March, and awards are made shortly thereafter, during the Department's Spring Celebration.

**Research.** While completing the coursework required for the major, many students become interested in specific research topics. Students who wish to conduct research under the direction of a faculty member may enroll in BIOL 501 (fall) or BIOL 502 (spring), with that faculty member's consent. Each student selects a research topic in consultation with a faculty sponsor. Consult faculty websites and the student research bulletin board to learn about current research conducted in each lab.

Many students find research opportunities away from campus during summers and winter terms. For example, the Research Experience for Undergraduates (REU) programs funded by the National Science Foundation and similar internship programs provide opportunities for students to engage in mentored research and receive room and board plus a stipend and a variety of institutions and field stations. You can find information about these and other programs at the Biology Department's Science Resources website (<https://www.oberlin.edu/career/set/online-resources/science>) and/or the Internships and Careers in Biology website (<https://www.oberlin.edu/arts-and-sciences/departments/biology/opportunities>).

Students may also conduct faculty-sponsored research with funding from Oberlin College or from external sources. For example, the Oberlin College Research Fellowship (OCRF) is a competitive program that provides two summers of research funding for students from groups historically underrepresented at American colleges and universities (<https://www.oberlin.edu/undergraduate-research/programs/ocrf>). The Oberlin Office of Undergraduate Research (OUR, <https://www.oberlin.edu/undergraduate-research>) lists many other research opportunities, and the Oberlin Center for Learning, Education, and Research in the Sciences (CLEAR, <https://www.oberlin.edu/clear>) also provides resources and support for student research.

Regardless of the opportunity or funding source, interested students should consult with potential faculty sponsors as soon as possible, as grant proposal deadlines are announced only a few times a year. Additional resources regarding student research grants are available from the Office of Undergraduate Research and the Career Development Center.

**Honors.** Candidates for honors in biology are accepted by the Department faculty early in the fall semester of their senior year on the basis of general ability, capacity to profit from independent work, and high motivation. As seniors, honors students enroll in Biology 501 and 502, carry out a research project selected in consultation with a faculty sponsor, give two required talks on their projects, submit a written thesis, and take an oral examination given by their thesis committees. Third-year students interested in this program may initiate a discussion of research possibilities with any member of the Biology faculty. The coordinator of the Honors Program in Biology for 2022-23 is Prof. Laura Romberg.

#### Department Prizes and Scholarships

The Department awards prizes and scholarships annually to students in recognition of scholastic excellence and professional promise. Awardees are honored at the Biology Department's Spring Celebration, and prize-winners are recognized college-wide during both the Honors Assembly and the Commencement Exercises. The prizes are funded by generous gifts from alumni and friends and are awarded to students deemed most deserving by the faculty. Academic scholarships are supported by endowed funds that enable students to take courses at biological field stations during the summer. The scholarships are awarded competitively, and their availability is announced early in the spring semester.

### Extracurriculars

The Biology Majors Committee is a student-run organization of current biology majors. The Committee sends representatives to the regular meetings of the Department faculty and, in general, serves as an important avenue for faculty-student contact outside of courses. Prof. Angie Roles is the faculty liaison for the Majors Committee in 2022-23.

### After the Major

What career paths do our majors pursue after graduating? A survey of two recent graduating classes showed that about 38% of our students pursue health careers, including advanced training in medicine, nursing, pharmacy, public health; approximately 20% seek research careers through graduate training in science and engineering programs; 9% are working as laboratory technicians; and about 7% pursue careers in K-12 education. Others report work in a variety of fields including nonprofit charities, conservation, writing and editing, the arts, and business.

How does a biology major prepare for life after Oberlin? The general pattern has been to match disciplinary interests and examine available options and opportunities. Listed below are the most common routes:

**Graduate School (MS or PhD).** Many majors find themselves interested in pursuing further training in biological research. For these students, graduate school is the next destination. Consult one or more members of the faculty and request advice on areas of study appropriate for your intended career. Many of the faculty members are knowledgeable about the institutions and fields of study that may be of interest to you. In addition, many faculty members are acquainted with the experiences of recent Oberlin graduates who may have been, or are, at the institutions you are considering. Many students take gap years, prior to joining graduate programs, during which they may complete internships, work as lab technicians, or otherwise gain relevant experience while deciding whether to pursue graduate school. We encourage you to discuss your goals and concerns with your faculty advisors.

Other sources of information are available as well. Graduate opportunities are posted on departmental bulletin boards in the Science Center, but many more graduate opportunities can be found online. Likewise, admissions criteria and financial aid vary from institution to institution and can be consulted online. Faculty members can help you navigate these resources if you schedule appointment(s) with them.

National and international scholarships and fellowship programs for graduate study in the sciences should be investigated by biology majors intending to pursue graduate studies. The Career Development Center is the best source of information regarding these opportunities.

**Health Science Professional Programs (such as MD, DVM, DPharm, MSN, etc.).** Students seeking admission to medical, dental, veterinary, and other health professional schools should learn about the academic and experiential learning requirements, admission exams and the overall timeline of the application process early on in their college years. Professor Peters, Pre-medical/health Program Director, supports your journey from academics to application materials and interviews. Please contact her via email, [mpeters@oberlin.edu](mailto:mpeters@oberlin.edu), to be included on the appropriate email lists so that you are contacted about learning opportunities and to schedule a one-on-one consultation. On campus student-led groups such as AMSA, Pre-Vet, and Pre-Dental also provide information and peer support for students with these career interests. Joining these is another invaluable tool to career exploration.

**Employment after Graduation.** The Career Development Center offers guidance, support, training, and interview opportunities for majors seeking employment immediately after graduation. Early in their college career, students should explore the numerous resources available at the Career Development Center, including workshops on resume preparation, interviewing skills, and networking. Recruiters from private companies and professional schools frequently contact the Career Development Center to schedule their campus visits.

**Other Sources of Information about Job Opportunities.** The Internships and Careers in Biology website (<https://www.oberlin.edu/arts-and-sciences/departments/biology/opportunities>) on the Biology Department website provides links to a variety of websites that list job and internship opportunities. Job announcements sent to the members of the Biology faculty are posted at this site and on bulletin boards near faculty offices. The Oberlin Career Development Center (<https://www.oberlin.edu/career>) is also an important source of opportunities. The Office of Alumni Affairs maintains a list of alumni who have expressed interest in discussing careers and employment opportunities. Other sources of information include off-campus supervisors with whom many students work on winter-term or summer projects. Finally, it helps to let some faculty members know of your job interests. The faculty often become aware of employment or fellowship opportunities informally and can call attention to suitable ones that may come along.

## **The Faculty**

Faculty members teach both the lecture and laboratory portions of their courses, which are described in the current College Catalog. In addition to conducting research, most faculty members sponsor student research projects, winter term projects, and private readings.

**Obianuju Genevieve Aguolu**, Visiting Assistant Professor of Biology (she/her). MBBS, Nnamdi Azikiwe University, Nigeria; MPH, University of Akron; PhD, Kent State University; Postdoctoral Associate, Yale University. Dr. Aguolu teaches Introduction to Global Health (BIOL 035), Essentials of Epidemiology (BIOL 235) and Human Anatomy (BIOL 234). Her research focuses on infectious disease epidemiology, vaccine acceptance, as well as maternal and child health.

**Taylor Allen**, Associate Professor of Biology (he/him). BSE, University of Pennsylvania; PhD, University of Washington. Professor Allen teaches courses on how the body functions (Biol 100 and 312) and wellbeing (FYSP 142). Research explores inclusive teaching practices, resilience and psychological wellbeing, and muscle contraction.

**Carrie Andrew**, Visiting Assistant Professor of Biology (she/her). BS, University of Wisconsin-Madison; PhD, Michigan Technological University. Research interests include: mycology, ecology, global change biology, observational data, data science & analytics. Teaches mycology (BIOL 335) and biology core courses (BIOL 100 lab & BIOL 200 lecture/lab).

**Jane E. Bennett**, Laboratory Instructor and Lecturer in Biology (she/her). BA, St Mary's University; MS, Wright State University. Ms. Bennett teaches laboratory classes in the introductory courses. She trains and coordinates the consultants and teaching assistants for these courses.

**Katherine E. Cullen**, Laboratory Instructor and Lecturer in Biology (she/her). BS, Michigan State University, E. Lansing; PhD, Vanderbilt University. Professor Cullen teaches laboratory courses in molecular biology, cell biology, biochemistry, genetics, ecology, and evolution, as well as Organismal Biology (BIOL 100) and Human Genetics (BIOL 086, for non-majors).

**Aaron Goldman**, Associate Professor of Biology (he/him). BA, Swarthmore College; PhD, University of Washington. Professor Goldman's research interests include the evolution of ancient protein families and the early evolutionary history of cellular life. He teaches courses on genomics (Biol 336) and on molecular biology, cell biology, and biochemistry (Biol 213).

**Marta Laskowski**, Robert S. Danforth Professor of Biology (she/her). BS, Indiana University; PhD, Stanford University. Professor Laskowski's research interests include plant physiology, plant developmental biology, and transgenic technologies. Her teaching includes the core course on organismal biology (Biol 100); an upper-level course and lab on plant development and function (Biol 221); and a first-year seminar.

**Roger H. Laushman**, Associate Professor of Biology (he/him). BS, University of Kansas; MS Iowa State University; PhD, University of Georgia. Interests include: botany; population ecology and genetics; conservation biology, and invasive species biology. Teaching includes: upper-level courses and labs on plant ecology (Biol 202); seminars in evolution and conservation biology (alternating between first-year and senior seminars); and a non- majors' course on environmental biology (Biol 103). He is also a member of the Environmental Studies Program Committee.

**Michael J. Moore**, Donald R. Longman Professor of Biology and Chair (he/him). BS, College of William and Mary; MS, University of Illinois, Urbana-Champaign; PhD, University of Texas. Professor Moore's research interests include: systematics and phylogeography of plants; assembly and evolution of North American floras; origin and evolution of edaphic endemism. He teaches Biol 100, an upper-level course and lab on plant systematics (Biol 323/324), a senior seminar (Biol 423), and a first-year seminar (FYSP 194).

**Maureen Peters**, Professor of Biology (she/her). BA, Washington University; PhD, Harvard University. Professor Peters is currently the Premedical/Health Advisor. Her interests include: classical and molecular genetics; cellular and molecular biology. She teaches a first year seminar and Genetic Analysis (BIOL 330).

**Alexandra Pike**, Visiting Assistant Professor of Biology (she/her). BS, Indiana University; PhD, Johns Hopkins University School of Medicine. She teaches laboratory courses in molecular biology, cell biology, and biochemistry (BIOL 213) and eukaryotic cell culture (BIOL 340), as well as an upper-level seminar on the biology of aging (BIOL 417). Her research interests include the molecular biology and biochemistry of DNA replication and telomere length regulation.

**Andrew Pike**, Visiting Assistant Professor of Biology (he/him). BA, Oberlin College; MS, Michigan State University; PhD, Johns Hopkins Bloomberg School of Public Health. Professor Pike's research interests include the interactions between insects and microorganisms and the ways that the mosquito immune system functions. He teaches core biology lecture (BIOL 100) and lab (BIOL 213 lab) courses as well as courses related to infectious diseases and human immunology (BIOL 337).

**Angela J. Roles**, Associate Professor of Biology (she/her). BS, Wake Forest University; PhD, Michigan State University. Professor Roles' research interests include the effects and context dependence of spontaneous mutations on plant fitness and the evolutionary ecology of local and invasive crayfishes. Her teaching includes: core course on genetics, ecology, and evolution (Biol 200); upper-level course and lab on genetics of populations (Biol 322); and alternating between a first-year seminar (FYSP 197) and a senior seminar (Biol 408).

**Laura Romberg**, Associate Professor of Biology (she/her). BA, Princeton University; PhD, University of California San Francisco. Professor Romberg's research interest is the biochemistry of bacterial cell division. She teaches courses in molecular biology, cell biology, and biochemistry (Biol 213), microbiology (BIOL 307), a senior seminar on the cell biology of host-pathogen interactions, and a first-year seminar on nutrition.

### **Support Staff**

**Dorothy Auble**, Resources Coordinator  
**Twila S. Colley**, Administrative Assistant  
**Laurie Holcomb**, Laboratory Technician  
**Judy Laushman**, Greenhouse Manager  
**Lori Lindsey**, Animal Caretaker  
**Forrest Rose**, Facilities Manager

## **Student Employment**

The Department employs students in various capacities during both the school year and the summer; some of the positions require financial-aid eligibility. Many laboratory courses employ student teaching assistants. Biology majors who are interested in these positions should check with the professors in charge of the courses and, additionally, Ms. Bennett for Biology 100. In addition, the introductory courses have OWLS and/or HOOTS. Students interested in these positions can find additional information on these and other positions at <https://www.oberlin.edu/clear/mentors>. The College also ensures that tutors are available when needed for Biology courses, especially introductory courses. Several part-time student worker positions are available during both semesters and the summer; interested students should check with Ms. Holcomb.

Students may also be employed as part-time or full-time research assistants under the auspices of various research or teaching grants awarded to individual professors. Some of these positions are for the school year and/or the summer. Students seeking this type of employment should consult with individual professors.

## Frequently Asked Questions

### **1. I am considering a double major, or a double degree. What is the best way to manage this?**

A double major means two majors in the College of Arts and Sciences, such as History and Biology majors or other combinations. A double major can be accomplished within the four years of your projected stay at Oberlin, especially if you identify your areas of interest and sign up with an advisor in each discipline as soon as possible. Common double-majors with Biology are Neuroscience, Environmental Studies, and Chemistry, but humanities and social science majors are also possible. Timely planning and good advice are crucial to completing both majors. Double majors are required to have two major advisors, one from each major program of study.

The double degree program requires admission to both the College and the Conservatory and is a five-year program earning a Bachelor of Arts from the College and a Bachelor of Music from the Conservatory. You will have two advisors, one from your College major and another from your Conservatory discipline. Strong organization skills and efficient planning are keys to success!

### **2. I want to be able to study abroad and get academic credit for it while I am in college. Is this possible at Oberlin?**

Yes, in several ways. There are study-away programs run by Oberlin, e.g. the Oberlin in London program. There are many 'abroad' programs with which Oberlin has consortial arrangements, as well as others from which Oberlin College accepts for transfer of academic credit. Consult the current course catalog for information, inquire from your advisor about the appropriateness of such a program, visit the Study Away Office in person or at <https://www.oberlin.edu/study-away>, and ask to speak to the appropriate adviser in the Dean of Studies Office.

### **3. Is there something I could do during Winter Term that would be relevant to my planned major in biology?**

Yes! Consider an individual or group project that will allow you to train in laboratory or field research, to do volunteer work at a hospital or health center, or to apprentice at a zoo or museum. Also worth considering are reading projects, MCAT reviews, seminar-type discussions, and similar activities both on and off campus (especially with alumni), provided a suitable sponsor can be found. Explore other possibilities by discussing Winter Term experiences with your advisor and with junior or senior majors.

### **4. Is there any meaningful summer work off-campus I could look into?**

That depends on what you mean by 'meaningful.' You could work for money, for experience, and/or for academic credit by taking courses at another institution (although you should first determine whether you may transfer such credits to Oberlin). You could seek a summer internship at a marine lab somewhere, work as a summer lab technician or hospital assistant or health-center volunteer, do field work (e.g. for the Nature Conservancy or the U.S. Forest Service), or conduct research on campus...possibilities abound. Think of what would be interesting and appropriate for you, and check with your advisor and older peers for suggestions.

### **5. What is research and how do I get involved in research with an Oberlin Biology faculty member?**

In addition to teaching, many of the biology faculty pursue research projects in their labs, with the aid of student assistants (sometimes for credit, BIOL 501/502). Each faculty researcher has specific research topics (see the earlier listing of faculty and interests) and is working on answering particular questions in their lab. "Research" is the practice of scientists – it is the building of new knowledge using the scientific method. Students may be engaged in this work at many stages – in the planning of experiments to address a question, in carrying out previously planned projects, collecting and analyzing data, or working on manuscripts for publication.

Research can be an incredibly valuable experience and the opportunity to do individual research with a professor is one of the things that makes an Oberlin education especially strong. Faculty labs are often space limited, so it is a good idea to start looking for a spot early in your Oberlin career (although we do recommend that you complete BIOL 100 before beginning to seek out a research experience.) To seek a spot in a lab, review the areas of faculty research on the website, and then reach out to faculty by email asking if you can set up a time to talk about research possibilities. You are not expected to have your own ideas as to what you want to research. Some professors will support you to follow up on your own ideas if it is feasible for them and you, but in general, you can expect to start by working on a project that is already ongoing and faculty will make suggestions as to specific projects that you might do in their lab. It is fine to contact more than one faculty member at this point.

For many students, being in a lab creates a social network and supports their classwork. You don't have to be a rock star to join a lab! What is needed is a strong interest, which will help when you inevitably have to pick yourself up after setbacks. You will also need to make sure you have the time in your schedule to commit to research. You can create time in your schedule by taking research as a half course (~ 5 h/ week is expected) or as a full course (~ 10 h/ week is expected). Those who wish to do honors should speak to a professor about the possibility during their third year. The honors program spans a full year; honors students enroll in BIOL 501 and BIOL 502 which creates time in their schedules. Come join us and find out what Biology is *really* about!

## **6. Should I do Honors?**

Honors can be a highly valuable experience for personal and professional development. Students who are admitted to the Honors program participate in a broad range of the scientific process over their final year at Oberlin. This includes developing a written proposal and presenting it as a public talk, performing the proposed research, and then writing a formal thesis. In the spring, students present their results at a public talk and defend their thesis before a 3-member committee composed of Oberlin faculty.

It is important to realize that Honors requires a considerable commitment of time and energy for both semesters of your final year, as well as a minimum grade-point average of 3.1 within the Biology major. Honors involves a greater time commitment than regular research: students enroll in Biol 501/502 for a full course rather than a half. Students need to carefully consider the pros and cons of completing Honors given their other academic and non-academic commitments during their final year. Timing is also a factor; by the end of your junior year, you should have identified a research advisor who agrees to sponsor your project during your senior year. Completing Honors in Biology is NOT required for admission to a graduate program after Oberlin. If you think you may be interested, you should consult with your advisor about honors as soon as possible, even if it is only a remote possibility in your plans.

## **7. How is Biology coursework related to the majors in Neuro, Biochem, or Environmental Studies?**

These majors require similar introductory or cognate courses. For example, BIOL 100 is also required for the Neuroscience major. Many electives count for two or more of the above majors. In addition, some faculty members have appointments in more than one department or major and are therefore important resources for advice regarding the overlap or interface of these related disciplines.

## **8. How do I arrange to consult with a biology faculty member about my courses, academic interests, and studying strategies? I am not sure how this is done and am intimidated/shy/nervous about doing it.**

Biology faculty will be happy to talk with you about your interests. Ask your current advisor (if not in the Biology faculty) about a professor they would recommend. Call or e-mail a Biology faculty member recommended by majors whom you know and trust. Arrange to meet with the Biology Chairperson. Take a Biology course. Come to a seminar. Ask your Resident Coordinator. Or, e-mail or approach a Biology faculty member and ask to sign up for an appointment during their office hours. A good introduction could be, "I think I want to be a biologist but am not sure. Could you help me decide?"

**9. Does the major in biology meet pre-med or pre-vet academic requirements?**

In part, yes. Medical, dental, veterinary, and allied-health-sciences schools in general require one year of college-level biology with lab, two years of chemistry with lab, one year of physics with lab, one year of math, and one year of English. The major in biology will more than adequately meet the biology requirement, and most of the chemistry requirement. We highly recommend that our majors take calculus, statistics, physics, and perhaps biochemistry, depending on their interests. Many pre-med students complete these courses. The English requirement is typically not a problem, as these courses count toward the Humanities requirement, and there are many excellent options available during a student's academic career. Some of our students who do not complete the pre-med preparation at Oberlin take the courses elsewhere during the summer or soon after graduation from Oberlin. The College's Premedical Program Director, Prof. Maureen Peters ([mpeters@oberlin.edu](mailto:mpeters@oberlin.edu)), is an excellent person to consult if your career interests involve the health professions.

## EXAMPLE PATHWAYS THROUGH THE BIOLOGY MAJOR

The biology major is flexible and can be adjusted to fit individual needs. The greatest flexibility in course options is possible when students take the year-long introductory chemistry sequence in the first year because the Biology major requires 3 Chemistry courses which must be taken in order and must begin in a fall semester (CHEM 101 is normally only offered in the fall). The primary benefit is having more flexibility in scheduling 300-level courses in Biology that require Chemistry, and more semesters available to study abroad. You may wish to consult your academic advisor or a Biology department faculty member for assistance in planning your path through the major.

Below, we give a brief overview of three sample pathways through the Biology major described in this document, before delving into greater detail on the following page.

### BRIEF OVERVIEW OF PATHWAYS

#### Example Pathway 1: Chemistry before Biology

For students who are certain of their interest in majoring in biology, one recommended approach is to begin with only introductory chemistry (CHEM 101 or CHEM 103) in the first semester, leaving introductory biology (BIOL 100) for the second semester. Many students experience a more successful college transition by beginning with only a single lab science course in the first semester.

#### Example Pathway 2: Biology before Chemistry

Students who wish to explore biology as a potential major and prefer not to take two science courses during their first semester may enroll in BIOL 100 first semester, BIOL 200 second semester, then begin the introductory chemistry series in the following fall. Students certain of their interest in majoring in biology may also take this approach.

#### Example Pathway 3: Biology and Chemistry

Students who are eager to enroll in introductory biology and have a strong science background may choose to register for both BIOL 100 and CHEM 101 in the first semester.

Notes:

- BIOL 103 does not count toward the Biology major. Students completing BIOL 103 must still begin the major with BIOL 100.
- Students interested in medical or other professional schools should consult the Pre-Medical Program Director (currently, Prof. Maureen Peters: [mpeters@oberlin.edu](mailto:mpeters@oberlin.edu)). Additional information for students considering medical school is available at <https://www.oberlin.edu/career/go/graduate-professional-school/medical-school>
- Some courses outside the Biology Department count toward the major in Biology. Consult the “Checklist of Biology Major Requirements” at the beginning of this document, or the current College Catalog.
- Remember to check that you will have the necessary prerequisites for the courses you plan to take.
- The Biology Department website has more information: <https://www.oberlin.edu/arts-and-sciences/departments/biology>
- A limited number of BIOL 100 seats are available to first-year students in the fall semester. Additional sections are offered in the spring semester.

## **DETAILED EXAMPLES OF PATHWAYS THROUGH THE MAJOR**

### **Example Pathway 1: Chemistry (and Math) before Biology**

Many students begin with only a single lab science course in the first semester. Beginning with only introductory chemistry (CHEM 101 or CHEM 103) in the first semester, and leaving introductory biology (BIOL 100) for the second semester offers several advantages. Introductory chemistry is required for the major in biology and for many upper level biomedical courses, and given that biology makes use of insights and tools from chemistry, as well as mathematics and statistics, starting with CHEM 101 (or CHEM 103), lays the foundation for a deep, conceptual understanding of biology.

#### **Year 1 Fall Courses:**

CHEM 101 + lab

*MATH 133 or CSCI 140/150\**

(2 Elective courses)

#### **Year 1 Spring Courses:**

CHEM 102 + lab

BIOL 100 + lab

(2 Elective courses)

#### **Year 2 Fall Courses:**

CHEM 205 + lab

BIOL 200 or 213 + lab

(2 Elective courses)

#### **Year 2 Spring Courses:**

BIOL 200 or 213 + lab

(3 Elective courses)

*\*MATH 133 or CSCI 140/150 may be delayed until a later semester for students not wishing to start with 2 NS courses in the first semester.*

Additional required major coursework in this pathway includes:

- One cognate quantitative course (if MATH 133 or CSCI 140/150 not taken)
- Four life science courses at the 200, 300, or 400-level, of which at least two must have a BIOL prefix, and at least two of which must have a lab. See the Biology Majors' Guidebook or the Course Catalog for details.

#### **Considerations:**

Note that CHEM 205 can be taken concurrently with either BIOL 200 or BIOL 213. The material covered in CHEM 205 overlaps somewhat with BIOL 213, but there is little overlap with BIOL 200. Either BIOL 200 or BIOL 213 could be delayed, though this will reduce the number of fall semesters available to take fall-only 300-level courses for which the delayed course (200 or 213) is a prerequisite.

**Example Pathway 2: Biology before Chemistry**

Students who wish to explore biology as a potential major and prefer not to take two science courses during their first semester may enroll in BIOL 100 first semester, BIOL 200 second semester, then begin the introductory chemistry series in the following fall. Students certain of their interest in majoring in biology may also take this approach. Beginning with biology and delaying chemistry will allow students earlier entry into upper-level elective biology courses that do not have chemistry prerequisites.

**Year 1 Fall Courses:**

BIOL 100 + lab  
(3 Elective courses)

**Year 1 Spring Courses:**

BIOL 200 + lab  
(3 Elective courses)

**Year 2 Fall Courses:**

CHEM 101 + lab  
(3 Elective courses)

**Year 2 Spring Courses:**

CHEM 102 + lab  
(3 Elective courses)

**Year 3 Fall Courses:**

BIOL 213 + lab  
(3 Elective courses)

**Year 3 Spring Courses:**

CHEM 205 + lab  
(3 Elective courses)

Additional required major coursework in this pathway includes:

- One cognate quantitative course
- Four 200-, 300-, or 400-level life science courses. At least two must have the BIOL prefix, and at least two must have a lab. See the Biology Majors' Guidebook or the Course Catalog for details.

**Considerations:**

1. Note that CHEM 205 can be taken concurrently with BIOL 213. Some students may find this beneficial (some overlapping material) while others may wish to avoid this (both are challenging courses).
2. Delaying CHEM 101 and 102 to the second year delays taking the required core course BIOL 213. This will leave only one fall semester to take fall-only 300-level courses that require BIOL 213 as a prerequisite. This includes many biomedical courses. You should consult the Course Catalog for the prerequisites and semesters offered for the upper-level courses you are interested in taking.
3. Delaying the year-long introductory chemistry sequence to the second year also reduces the number of semesters during which study abroad is feasible.
4. A limited number of BIOL 100 seats are available to first-year students in the fall semester. Additional sections are offered in the spring semester.

**Example Pathway 3: Biology and Chemistry**

Students who are eager to enroll in introductory biology and have a strong science background may choose to register for both BIOL 100 and CHEM 101 in the first semester. Alternatively, some students choose to take CHEM 101 and a mathematics or computer science course in the first semester, delaying BIOL 100 to the second semester. Note that introductory chemistry may be started only in fall semester, whereas introductory biology may be taken in either semester.

**Year 1 Fall Courses:**

CHEM 101 + lab  
BIOL 100 + lab  
(2 Elective courses)

**Year 1 Spring Courses:**

CHEM 102 + lab  
BIOL 200 + lab  
(2 Elective courses)

**Year 2 Fall Courses:**

BIOL 213 + lab  
(3 Elective courses)

**Year 2 Spring Courses:**

CHEM 205 + lab  
(3 Elective courses)

Additional required major coursework includes:

- One cognate quantitative course,
- Four 200-, 300-, or 400-level life science courses, at least two of which have the BIOL prefix and at least two of which must have a lab. See the Biology Majors' Guidebook or the Course Catalog for details.

**Considerations:**

1. Note that CHEM 205 can be taken concurrently with BIOL 213. Some students may find this beneficial (some overlapping material) while others may wish to avoid this (both are challenging courses).
2. A limited number of BIOL 100 seats are available to first-year students in the fall semester. Additional sections are offered in the spring semester.

## Guidelines for Requesting Letters of Recommendation

1. **Choose your recommenders well.** Letters of recommendation are intended to provide information not discernible from a transcript or a resume. Such information includes class performance, technical expertise, laboratory experience, overall academic qualifications, motivation, personality characteristics, manual dexterity, work ethic, and so on. It would be wise, then, to seek letters from persons who can describe you in these regards because they have been your teachers in small class settings, or are your academic advisors, or laboratory supervisors.
2. **Be considerate.** Give your recommender *at least two weeks* notice (three to four weeks is better).
3. **Come prepared.** Provide your recommender the following materials or information:
  - a. a list of individuals or institutions to whom letters should be submitted/sent
  - b. clearly indicated deadlines for each letter, as well as the format in which the letter should be sent (by email? by online submission site? by regular mail?)
  - c. recommendation forms, if required\*

\*In these cases, please fill out applicant sections on these forms before giving them to the recommender. Do not overlook spaces for your signature. Most recommendation forms require that you sign a waiver that guarantees confidentiality of the recommendation. In general, it is good to waive your right to see a recommendation letter written on your behalf because the recipient of the letter will have greater confidence that the letter was written candidly.
  - d. current resume or curriculum vitae
  - e. copy of relevant application essay and/or letter of application
  - f. current external or internal transcript
  - g. if available/applicable, your scores on the GRE, MCAT, etc.
  - h. any additional information (job description, work experience, extra-curricular activities) that may be relevant to the position you are seeking
4. **Follow up.** If you wish to be notified when the letter you have requested has been sent, you should tell your recommender and perhaps ask that they notify you by email. Recommenders are generally eager to find out whether or not their recommendation has helped you, so it is a nice touch to let them know what happened.

## **Biology Department Course Transfer Guidelines**

*Please consult with the Biology Department Chair to pre-approve your course before you commit to taking it!*

### **Primary criteria for counting transfer courses through the Oberlin Biology Department:**

1. The depth and breadth of material covered in the course is at a level commensurate with that of similar courses at Oberlin.
2. Topics covered by the course must predominantly center on biological principles or applications.
3. If a transfer course is to be used to replace BIOL 100, BIOL 200, or BIOL 213, the topics, core concepts, and competencies covered in the transfer course must closely match those of the relevant Oberlin course, including the laboratory component.

### **Transferring a course to count toward general graduation credit at Oberlin, but not to the Oberlin Biology major or related majors?**

*Submit the following items from the institution offering the course you want to take to the Oberlin Biology Department Chair:*

1. Course syllabus.
2. Catalog description.
3. Documentation listing prerequisites for the course (this information may appear on the syllabus or course description, but if it does not, please submit other documentation verifying the prerequisites).

### **Transferring a course to count toward the Oberlin Biology major or related majors?**

*Submit the following items from the institution offering the course you want to take to the Oberlin Biology Department Chair:*

1. Course syllabus.
2. Catalog description.
3. Documentation listing prerequisites for the course (this information may appear on the syllabus or course description, but if it does not, please submit other documentation verifying the prerequisites).
4. Documentation addressing how the course applies to the biology or related major at the home institution. If the course is from a community college, provide documentation addressing how the course may be counted toward a biology or related major at 4-year institutions in the home state.

***NOTE: The Biology Department Chair may request additional information about the course beyond that described above.***

***If you get a course pre-approved, be sure to save a copy of the form so you can present it to the chair after you complete the course.***