Introduction

Majoring in Biology is a good starting place for students interested in the field of science but who are unsure of a specific concentration. Biology majors have different areas of study to choose from such as the genetics and development of organisms, the function of processes of living things, the interrelationships of organisms within their environment or the study of organisms on a cellular and molecular level.

There is a wide range of employment opportunities for graduates with a major in biology. Although a bachelor’s degree is often enough preparation for entry level positions, many biology majors (30-40%) continue on to graduate and professional schools. Some sample jobs without any further education include: secondary school teacher, biological scientist and researcher in industry, health technologist and technicians in hospitals.

Functional Skill Set for Biology majors:

- Operate scientific equipment
- Information handling & organization
- Biology theory & practical knowledge
- Oral & written communication
- Analytical & quantitative abilities
- Problem solving
- Teamwork
- Independent worker
- Curiosity and creativity
- Statistical awareness
- Numerical computation
- Innovative talents
- Technical skills
- Learn new information quickly
- Technological skills
Related Career Titles for Biology Majors

- Agricultural Researcher
- Agronomist
- Animal Biologist
- Animal Scientist
- Aqua Culturist
- Aquaculture Farmer
- Aquarium & Museum Worker
- Aquarium Technician
- Aquatic Biologist
- Asst./Assoc. Scientist
- Bacteriologist
- Barrier Beach Manager
- Bioanlyst
- Biochemist
- Bioengineer
- Biological Photographer
- Biological Scientist
- Biologist
- Biomedical Engineer
- Biometrician
- Biophysicist
- Biotechnology
- Botanist
- Brewery Laboratory Assistant
- Chemical Laboratory Technician
- Chemical Oceanographer
- Chiropractor
- Clinical Chemist
- Clinical Data Processor
- Coastal Resources Worker
- Commercial Fishing Engineer
- Commercial Inland Water
- Coroner
- Crop Scientist
- Cytotechnologist
- Dental Hygienist
- Dentist
- Dietitian & Nutritionist
- Druggist
- Ecologist
- Emergency Medical Technician
- Entomologist
- Environmental Analyst
- Environmental Attorney
- Environmental Ecologist
- Environmental Educator
- Environmental Engineer
- Environmental Health Specialist
- Environmental Protection Worker
- Ergonomist
- Fish Hatchery Technician
- Fish Processor
- Fisheries conservation
- Fishing Captain
- Florist
- Food Chemist
- Food Technologist
- Forrester
- General Practitioner
- Geneticist
- Health Officer
- Histologist
- Horticulturist
- Hospital Administrator
- Hydrographic Survey Technician
- Industrial Hygienist
- Industrial Marine Economist
- Licensed Practical Nurse
- Limnologist
- Marina Worker
- Marine & Coastal Consultant
- Marine & Fisheries/Worker
- Marine Bacteriologist
- Marine Biologist
- Marine Ecologist
- Marine Engineering Tech
- Marine Tourist Worker
- Market Research Analyst
- Medical Doctor
- Medical Examiner
Some Organizations that Typically Employ Biology Majors:

- Agricultural Chemical Companies
- Agricultural Firms-Research
- Agriculture
- Animal & plant Health Inspection Service
- Aquariums
- Atomic Energy Commission
- Biological book/journal publishers
- Board of Health
- Botanical Gardens & Arboretums
- Bureau of Land Management
- Center for Disease Control
- Chemical, Drug, and Allied Product Firms
- Colleges/Universities
- Conservation Agencies
- Consulting Engineering Firms
- Consumer Product Safety Commission
- Department of Commerce
- Department of Environmental Protection
- Department of Health & Human Services
- Department of Interior Office
- Department of the Army
- Department of the Navy
- Department of Veteran’s Affairs
Start a Strategic Plan:

- Develop excellent communication skills.
- Gain an understanding of the areas related to biological science—biotechnology, genetics, physiology, ecology, microbiology, mycology, systematic biology, entomology, marine and aquatic biology and zoology, then choose the area you are interested in. Due to the diversity of this major, it is recommended you speak to faculty advisors about all the possible opportunities within this major.
- Develop a broad background in biology and other related laboratory equipment.
- Develop a broad background in biology and other related subjects such as chemistry, physics, mathematics, computer technology and statistics. Take courses in area(s) of specialization.
- Develop work habits that are systematic, precise, and patient.
- Obtain specialized certification for some medical areas.
- Develop necessary eye-hand coordination.
- Learn to work well in teams and acquire the ability to interface with scientists.
- Develop in-depth programming and relational database skills.
- Learn molecular biology packages, web design, and programming skills.
- Certification is required for public school teaching positions.
- Gain experience working with students through tutoring or volunteering.
- Develop excellent interpersonal and public speaking skills.
- Develop strong writing skills and command of the English language.
- Acquire word processing and desktop publishing skills.
- Find a part-time, summer, co-op or internship position with a publisher.
- Obtain retail or sales experience.
- Hold leadership positions in campus organizations.
- Maintain a high grade point average to improve chances of graduate school admission.
• Complete an undergraduate research project.
• Secure strong personal recommendations from professors or employers.
• Learn federal, state, and local government job application process. The federal government is the largest employer of biologists.
• Acquire internships in federal or state government.
• Look at majors and minors that will add to your employment options such as business, chemistry, physics, computer programming, photography, graphic illustration and journalism.
• Acquire a graduate degree for advancement and specialized positions.

**Professional Organizations and Associations for Biologists**

Biotechnology Industry Organization  
1525 K St. North, #1100  
Washington DC  20006  
[www.bio.org/](http://www.bio.org/)

American Society for Microbiology  
1325 Massachusetts Ave. NW  
Washington DC  20005  
[http://www.asm.org](http://www.asm.org)

The American Institute of Biological Sciences  
1441 I Street, NW, Suite 200  
Washington DC  20005  
[http://www.aibs.org](http://www.aibs.org)

American Association of Zoo Keepers  [http://www.aazk.org](http://www.aazk.org)  
European Molecular Biology Organization  [http://www.embo.org](http://www.embo.org)  
International Marine Animal Trainers Association  [www.imata.org](http://www.imata.org)  
American Academy of Forensic Science  [www.aafs.org](http://www.aafs.org)  
American Association for the Advancement of Science  [www.aaas.org](http://www.aaas.org)
## BIOLOGICAL SCIENCES

### What can I do with this major?

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<tr>
<th>AREAS</th>
<th>EMPLOYERS</th>
<th>STRATEGIES</th>
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<tbody>
<tr>
<td><strong>RESEARCH AND DEVELOPMENT</strong></td>
<td>Industry and laboratories: Pharmaceutical Healthcare Agriculture production Food processing and safety Environmental Private research institutions Public health departments State and federal government: National Science Foundation National Institutes of Health Food and Drug Administration Environmental Protection Agency Department of Agriculture Armed Services Department of Homeland Security State and local government laboratories/agencies Colleges and universities</td>
<td>Learn to set up, operate, maintain laboratory instruments and equipment, and monitor experiments. Select courses with laboratory components. Seek research experience with professors. Gain related experience through part-time jobs, internships, or volunteering. Complete a certificate training program, usually one year, to learn specialized laboratory techniques. Take a course in grant writing. A Bachelor’s degree in biology qualifies one for laboratory technician or research assistant positions. Earn master’s degree for better positions, advancement opportunities, more responsibility and higher pay. Obtain Ph.D. to direct research projects and lead research teams. Maintain a high grade point average and secure strong faculty recommendations to gain admittance into graduate school.</td>
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<tr>
<td><strong>ORGANISMAL BIOLOGY</strong></td>
<td>Colleges and universities, especially colleges of agriculture and veterinary medicine Veterinary hospitals State and federal government: Departments of Agriculture, Interior, and Health Independent laboratories: Food production Textiles Chemical Pharmaceutical Forestry products</td>
<td>Seek related experience through coursework, part-time jobs, internships or volunteering. Conduct research or assist in research including the collection of information and samples of water, soil, plants, animals, etc. Join student chapters of professional organizations related to your area of interest. Obtain a Ph.D. for teaching and advanced research and management positions.</td>
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**Some Areas of Specialization**
- Botany and Plant sciences
- Ecology and Wildlife
- Marine and Aquatic
- Systematic (Taxonomy)
- Zoology
- Entomology
- Genetics
- Microbiology
  - Bacteria, algae, fungi, molds, yeasts, viruses, protozoa
## Areas of Specialization

### Organismal Biology Continued
- Biophysics
- Biochemistry
- Cellular and Molecular Biology
- Cytology
- Genetics
- Immunology
- Pathology
- Pharmacology
- Physiology
- Virology

### Biomedical Sciences

#### Some Areas of Specialization:
- Biophysics
- Biochemistry
- Cellular and Molecular Biology
- Cytology
- Genetics
- Immunology
- Pathology
- Pharmacology
- Physiology
- Virology

#### Employers
- Colleges and universities
- Professional schools including colleges of pharmacy, dentistry, medicine, veterinary medicine, and agriculture
- Federal laboratories and regulatory agencies:
  - National Institutes of Health
  - Food and Drug Administration
- State and local public health departments
- Clinics and hospitals
- Private research foundations
- Independent laboratories
- Pharmaceutical companies
- Zoos and aquariums
- Fish hatcheries
- Wildlife preserves and parks
- Conservation agencies
- Botanical gardens and arboretums
- Museums
- Agricultural experiment stations
- Inspection agencies and control boards
- National and international environmental organizations
- Private recreation organizations

#### Strategies
- Gain laboratory experience through coursework and/or research projects with professors.
- Learn to set up, operate, maintain laboratory instruments and equipment, and monitor experiments.
- Seek internships, part-time employment and volunteer opportunities in the biomedical field.
- Join student chapters of professional organizations related to your area of interest.
- Take courses in area(s) of specialization and/or consider an advanced degree.
- Obtain a Ph.D. for teaching and advanced research and management positions.

### Healthcare

- Medicine
- Dentistry
- Optometry
- Podiatry
- Veterinary Medicine
- Allied Health
  - Occupational Therapy
  - Physical Therapy
- Medical Technology
- Nuclear Medicine

#### Employers
- Hospitals
- Medical centers and clinics
- Nursing homes
- Private practice
- Armed services
- Government agencies

#### Strategies
- Plan on attending medical school or other related graduate program.
- Maintain an outstanding grade point average, particularly in the sciences.
- Secure strong faculty recommendations.
- Meet with a pre-health advisor periodically.
- Join related student organizations, and demonstrate leadership abilities.
- Seek experiences in hospital or healthcare settings through volunteering, shadowing, part-time positions, or internships.
### AREAS

<table>
<thead>
<tr>
<th>HealthCare Continued</th>
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<td><strong>STRATEGIES</strong></td>
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Develop a back-up plan in case medical/graduate school admission is denied. Consider alternative but related careers such as physician assistants. Research all of the various fields within medicine to determine career goals.

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<tbody>
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<td>Data Analysis and Interpretation</td>
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<tr>
<td>Information Management</td>
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<td>Organization and Retrieval</td>
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| **STRA
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Colleges and universities
Private research foundations
Independent laboratories:
- Organic and agricultural chemicals
- Drug and pharmaceutical
- Medical device and equipment
- Research, testing, medical
Federal laboratories and regulatory agencies:
- National Institutes of Health
- Food and Drug Administration
- Environmental Protection Agency
- Department of Agriculture
- National Biological Information Infrastructure

Develop multiple areas of specialization through coursework, minors, double-majors in molecular biology, mathematics, statistics, computer science, or machine learning.
Develop strong programming and database management skills; fluency in several programming languages is helpful.
Learn biological software systems.
Complete an internship in an area of interest.
Seek master's degree for increased advancement opportunities.

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<tr>
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<tr>
<td>Elementary</td>
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<td>Secondary</td>
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<td>Post-Secondary</td>
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<td>Non-classroom Education</td>
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ETIES** |

Universities and colleges
Medical and other professional schools
Public and private schools, K-12
Museums
Zoos
Nature centers and parks

Gain experience working with students through tutoring, part-time employment, or volunteering.
Learn to work well with all types of people.
Develop excellent interpersonal and public speaking skills.
Certification is required for K-12 school teachers and varies by state.
Master's degrees may be sufficient for teaching at community or two-year institutions.
Ph.D. is needed for teaching opportunities at colleges and universities.
### COMMUNICATION

**Areas:**
- Technical Writing
- Editing
- Illustrating
- Photography

**Employers:**
- Publishing companies including scientific magazines, professional journals, periodicals, textbooks, and online publishers
- Newspapers
- Educational and scientific software companies
- Zoological and environmental societies
- Medical, dental and veterinary colleges
- Research centers
- Federal government agencies
- Related nonprofit organizations
- Museums

**Strategies:**
- Acquire thorough knowledge of photographic procedures and technology.
- Take specific courses in biological, medical, and ophthalmic photography; courses in illustration and printing are also helpful.
- Develop strong writing skills and command of the English language.
- Take advanced courses in technical writing or journalism classes or consider a minor in either.
- Join professional associations like the National Association of Science Writers.
- Seek related volunteer or paid experiences with student/local publications to increase marketability.
- Obtain an advanced degree in scientific journalism.

### LEGISLATION/LAW

**Areas:**
- Lobbying
- Regulatory Affairs
- Science Policy
- Patent Law
- Environmental Law

**Employers:**
- Federal and state government
- Law firms
- Large corporations

**Strategies:**
- Develop excellent communication and interpersonal skills.
- Maintain current knowledge of industry-specific laws and policies.
- Acquire internships in federal or state government.
- Take courses in history, political science and/or legal studies.
- Acquire a Ph.D. for advanced positions.
- Earn a J.D. degree to practice law.

### BUSINESS/INDUSTRY

**Areas:**
- Technical and Pharmaceutical Sales
- Management
- Consulting
- Marketing

**Employers:**
- Manufacturing companies including:
  - Pharmaceuticals
  - Animal pharmaceuticals
  - Laboratory equipment
  - Medical supplies and prostheses
  - Marketing firms
  - Consulting firms

**Strategies:**
- Develop excellent communication and interpersonal skills.
- Demonstrate a high energy level.
- Take courses in anatomy, pharmacology, and chemistry.
- Obtain sales experience and/or a business minor.
- Join related student associations and hold leadership positions.
- Consider an MBA or Professional Science Master's for advanced management and consulting opportunities.
GENERAL INFORMATION

• A Bachelor’s degree will qualify one for work as a laboratory assistant, technician, technologist, or research assistant in education, industry, government, museums, parks, and gardens.
• An undergraduate degree can also be used for nontechnical work in writing, illustration, sales, photography, and legislation.
• Master’s degrees allow for more opportunities in research and administration. Some community colleges will hire Master’s level teachers.
• Doctoral degrees are necessary for advanced research and administrative positions, university teaching, and independent research.
• An advanced degree provides the opportunity to specialize in fields of interest.
• The biological sciences are good preparation for a career in healthcare such as medicine, dentistry, and veterinary science, but professional degrees and licenses are also necessary to practice in these fields.
• Learn laboratory procedures and become familiar with equipment.
• Obtain summer, part-time, volunteer, co-op, or internship experience to test the fields of interest and gain valuable experience. Take independent research classes if possible.
• Participate in summer research institutes. Submit research to local poster competitions or research symposiums.
• Develop strong analytical, computer, mathematics, and communications skills.
• Join professional associations and community organizations to stay abreast of current issues in the field and to develop networking contacts.
• Read scientific journals related to your area of interest.
• Maintain a high grade point average to improve chances of graduate and professional school admission.
• Become familiar with the specific entrance exam for graduate or professional schools in your area of interest.
• Secure strong relationships and personal recommendations from professors and/or employers.
• Consider completing a post doctoral experience after graduate school.
• Learn federal, state, and local government job application process. The federal government is the largest employer of biologists.
• Gain experience with grant writing and fundraising techniques. Often research must be funded in this manner.