

# BIOLOGICAL SCIENCES

## What can I do with this major?

AREAS	EMPLOYERS	STRATEGIES
<p><b><u>RESEARCH AND DEVELOPMENT</u></b></p> <p>Basic Applied Quality control Administration Grant writing</p>	<p>Industry and laboratories: Pharmaceutical Healthcare Agriculture Food processing and safety Biotechnology Environmental</p> <p>Private research institutions Public health departments</p> <p>State and federal government: National Science Foundation National Institutes of Health Centers for Disease Control and Prevention Food and Drug Administration Environmental Protection Agency Department of Agriculture Armed Services Department of Homeland Security</p> <p>Colleges and universities</p>	<p>Learn to set up, operate, and maintain laboratory instruments and equipment, and monitor experiments.</p> <p>Select courses with laboratory components, and seek research experience with professors.</p> <p>Gain related experience through part-time jobs, internships, or volunteering.</p> <p>Complete a certificate training program, usually one year, to learn specialized laboratory techniques.</p> <p>Take a course in grant writing, as often research is grant-funded.</p> <p>A bachelor's degree in biology qualifies one for laboratory technician or research assistant positions.</p> <p>Earn master's degree for advancement opportunities, more responsibility and higher pay.</p> <p>Obtain Ph.D. to direct research projects and lead research teams.</p> <p>Maintain a high grade point average and secure strong faculty recommendations to gain admittance into graduate school.</p>

### **HEALTHCARE**

See also *What can I do with this major in medical fields?*

Medicine  
Dentistry  
Optometry  
Podiatry  
Pharmacy  
Veterinary medicine  
Allied health:  
    Occupational therapy  
    Physical therapy  
Medical technology  
Nuclear medicine

Group or private practice  
Hospitals  
Clinics  
Health networks  
Nursing homes  
Rehabilitation centers  
Mental health institutions  
Federal, state, and local health departments  
Government agencies  
Armed services  
Correctional facilities  
Colleges or universities  
Medical schools  
Large corporations

Plan to attend medical school or other related graduate program.

Meet with a pre-health advisor periodically to discuss curricular decisions.

Maintain a high grade point average, particularly in the sciences, to improve chances of admission to graduate or professional school.

Research accredited institutions. Check graduation rates, success rates on licensing exams, cost, location, etc. Speak with current students.

Secure strong faculty recommendations.

Join related student organizations and demonstrate leadership abilities.

**AREAS**

**EMPLOYERS**

**STRATEGIES**

**HEALTHCARE CONTINUED**

Seek experience in healthcare settings through volunteering, shadowing, part-time jobs, or internships.  
Research the various fields within medicine to determine career goals, and develop a back-up plan in case medical/graduate school admission is denied.

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**BIOMEDICAL SCIENCES**

Some areas of specialization:  
Biophysics  
Biochemistry  
Cellular and molecular biology  
Genetics  
Immunology  
Infections Disease  
Pathology  
Pharmacology  
Physiology  
Virology

Colleges and universities  
Professional schools: Colleges of pharmacy, dentistry, medicine, veterinary medicine, and agriculture  
Federal government:  
National Institutes of Health  
Centers for Disease Control and Prevention  
Food and Drug Administration  
State and local public health departments  
Clinics and hospitals  
Private research foundations  
Independent laboratories  
Pharmaceutical companies

Gain laboratory experience through coursework and faculty-led research projects.  
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. Utilize your campus career center for assistance securing government internships.  
Take courses in area(s) of specialization, such as genetics or pharmacology.  
Join student chapters of professional organizations related to your area of interest to maintain knowledge of your desired field.  
Obtain a Ph.D. for teaching and advanced research and management positions, which requires navigating a competitive admissions process with strong faculty recommendations, grades, and relevant experience.

## AREAS

### ORGANISMAL/ECOLOGICAL BIOLOGY

Structure, Function, Development, Evolution

Some areas of specialization:

Botany

Ecology:

Behavioral, community, ecosystem, evolutionary, population biology

Conservation biology

Entomology

Marine biology

Genetics

Microbiology:

Bacteria, algae, fungi, molds, yeasts, viruses, protozoa

Taxonomy

Zoology

## EMPLOYERS

Colleges and universities, especially colleges of agriculture and veterinary medicine

Veterinary hospitals

State and federal government:

National Science Foundation

National Institutes of Health

Centers for Disease Control and Prevention

Food and Drug Administration

Environmental Protection Agency

Department of Agriculture

Independent laboratories:

Food production

Textiles

Agriculture

Pharmaceutical

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

Conduct research or assist in research including the collection of information and samples of water, soil, plants, animals, etc.

Pursue extensive laboratory and research experience by working with faculty, through independent research classes, as a student employee, or through other departmental programs.

Plan to gain related part-time jobs, internships, or volunteer experiences.

Seek additional coursework in an area of specialty (e.g., botany, ecology, genetics).

Join student chapters of professional organizations related to your area of interest.

Build relationships with faculty who can serve as graduate school references, and maintain a high GPA for competitive admission to medical school.

Obtain a Ph.D. for teaching, advanced research, and management positions.

## AREAS

## EMPLOYERS

## STRATEGIES

### **BIOTECHNOLOGY**

Medicine  
Agriculture  
Food science  
Biological engineering  
Bioremediation  
Environmental protection/Regulation

Biotechnology companies:  
Agricultural chemicals  
Food safety  
Pharmaceutical  
Medical device and equipment  
Research and testing  
Federal government:  
National Institutes of Health  
Centers for Disease Control  
Food and Drug Administration  
Environmental Protection Agency  
Department of Agriculture  
Plant propagation and production businesses  
Colleges and universities

Gain practical experience conducting research, collecting and analyzing data, and using laboratory/field techniques in collaboration with professors and through internships.  
Hone your ability to gather, assess, evaluate, interpret, and share technical and scientific information.  
Seek current knowledge of medical, agricultural, pharmaceutical, or environmental issues, trends, regulations.  
Join horticultural, agronomy, biotechnology clubs or other student professional associations to network and cultivate related academic interests.  
Pursue a master's or doctoral degree to specialize and for advancement in the field. Some federal and private agency and research positions require a graduate degree.  
Maintain a strong grade point average to be competitive for graduate school admission.

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### **BIOINFORMATICS**

Algorithm and statistical techniques  
Data analysis and interpretation  
Information management  
Organization and retrieval

Colleges and universities  
Private research foundations  
Software development firms  
Biotechnology companies:  
Agricultural chemicals  
Pharmaceutical  
Medical device and equipment  
Research and testing  
Federal laboratories and regulatory agencies:  
National Institutes of Health  
Food and Drug Administration  
Environmental Protection Agency  
Department of Agriculture

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 the areas of tool building, usage, or maintenance.  
Seek master's or Ph.D. degree for increased advancement opportunities.

## AREAS

## EMPLOYERS

## STRATEGIES

### EDUCATION

Teaching:

Elementary

Secondary

Post-secondary

Non-classroom education

Public and private schools, K-12

Two-year community colleges/technical institutes

Four-year colleges and universities

Professional schools: Colleges of pharmacy, dentistry, medicine, veterinary medicine, and agriculture

Museums

Zoos

Nature centers and parks

Gain experience working with students through tutoring, part-time employment, or volunteering.

Learn to work well with people of varying backgrounds and skills.

Develop excellent interpersonal, communication, and content area knowledge.

Complete a teacher preparation program for K-12 positions, which varies by state. A major in content area is required for secondary education in most states.

Master's degrees may be sufficient for teaching at community or two-year institutions.

Seek Ph.D. for teaching opportunities at colleges and universities.

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### COMMUNICATION

Technical writing

Editing

Illustrating

Photography

Public relations

Publishing companies: 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

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 or the Public Relations Student Society of America.

Seek related volunteer or paid experiences with student/local publications to increase marketability.

Consider earning an advanced degree in a communications field to specialize (e.g., scientific journalism or public relations).

**AREAS**

**EMPLOYERS**

**STRATEGIES**

**LEGISLATION/LAW**

Lobbying  
Regulatory affairs  
Science policy  
Patent law  
Environmental law  
Nonprofit or public interest  
Mediation

Law firms  
Corporations  
State and federal government:  
    Department of Energy  
    Environmental Protection Agency  
Environmental compliance services companies  
Regulatory commissions  
Advocacy organizations

Develop strong research and writing skills. Enhance communication skills through public speaking courses, debate team, or Toast Masters (a public speaking organization).  
Maintain current knowledge of industry trends, laws and policies specific to area of interest (e.g., environment, food safety, regulatory programs).  
Acquire internships in federal or state government. Utilize applicable websites and seek assistance from your college career center.  
Take courses in history, political science and/or legal studies to supplement science curriculum.  
To pursue a J.D., participate in mock trial and pre-law associations, learn law school admissions process.

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**BUSINESS/INDUSTRY**

Technical and pharmaceutical sales  
Management  
Consulting  
Marketing

Manufacturing companies:  
    Food/Feed  
    Agricultural chemicals  
    Pharmaceuticals  
    Medical device and equipment  
    Consumer products  
Marketing firms  
Consulting firms

Develop excellent communication and interpersonal skills, and demonstrate a high energy level.  
Take courses in anatomy, pharmacology, and chemistry to supplement curriculum. Consider a business minor.  
Seek experience through part-time jobs and internships in business; experience in sales may be necessary for some positions.  
Join related student associations and pursue leadership positions.  
Be prepared to start in entry level positions, such as management trainee programs.  
Consider an MBA or Professional Science Master's to advance into higher levels of business management, consulting, research, and brand management.

**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.
- A master's degrees allow for greater specialization in a field and 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.
- The biological sciences are good preparation for a career in healthcare that generally require a professional degree and license such as medicine, dentistry, and veterinary science.
- 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 scientific communication 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 processes.
- Gain experience with grant writing and fund raising techniques, research is often grant-funded.