

# Biological Sciences

## What can I do with this major?

OCCUPATIONS	EMPLOYERS	SKILLS TO DEVELOP
<p><b><u>BIOTECHNOLOGY</u></b>            Research and Development            Laboratory Testing            Teaching</p>	Colleges and universities Pharmaceutical companies Agricultural industry including fertilizer manufacturers and animal and plant breeding and production Federal and state government laboratories and agencies Industry, particularly biotechnology firms	<ul style="list-style-type: none"> <li>• Develop excellent laboratory skills.</li> <li>• Acquire a Ph.D. for college and university teaching and advanced positions in research, development, and management.</li> <li>• Take additional courses in science and mathematics.</li> <li>• Learn to problem solve.</li> <li>• Develop work habits that are systematic, precise, and patient.</li> </ul>
<p><b><u>GENETICS</u></b>            Research and Development related to:            Animals            Plants            Humans            Genetic Counseling</p>	Colleges and universities Pharmaceutical companies Large producers of seed, livestock, and poultry Large fur breeding farms Government laboratories Department of Agriculture Fish and Wildlife Service National Institutes of Health Biotechnology industry Hospitals and medical centers	<ul style="list-style-type: none"> <li>• Acquire a broad background in sciences, mathematics, and computer technology.</li> <li>• Obtain a Ph.D. for advanced positions in research and management.</li> <li>• Earn a master's degree from an accredited program for genetic counseling.</li> </ul>
<p><b><u>MYCOLOGY</u></b>            Teaching            Research</p>	Colleges and universities Professional schools of medicine, forestry, and agriculture Medical research laboratories Private research institutes Pharmaceutical industry Public Health Service Industries and laboratories involved in production of food, leather, textiles, and forestry products Chemical manufacturers State and federal government laboratories	<ul style="list-style-type: none"> <li>• Acquire knowledge and skills in specialized areas; knowledge of industrial chemistry is especially helpful.</li> <li>• Take courses in organic chemistry, biochemistry, and physics.</li> <li>• Acquire a graduate degree for more opportunities.</li> <li>• Obtain a Ph.D. for teaching and advanced positions in research and management.</li> </ul>

## OCCUPATIONS

## EMPLOYERS

## SKILLS TO DEVELOP

### **MICROBIOLOGY**

Research  
Teaching  
Production  
Quality Control

Colleges and universities  
Professional schools of medicine, dentistry,  
public health, nursing, pharmacy, veterinary  
medicine, and agriculture  
Private research foundations  
Government research laboratories and service  
agencies  
Hospitals and public health facilities  
Agricultural experiment stations  
Food, chemical, pharmaceutical, and cosmetic  
companies  
Industry including wood products, paper,  
textiles, optical equipment, leather, and  
electrical equipment  
Environmental and pollution control agencies

- Obtain a Ph.D. for teaching and advanced research and management positions.
- Take additional courses in chemistry, biology, mathematics, and physics.
- Take courses related to your field of interest such as botany, plant pathology, etc.
- Obtain specialized certification for some medical areas.
- Develop necessary eye-hand coordination.
- Learn to work well with others.

### **SYSTEMATIC BIOLOGY**

Teaching  
Research  
Field and Laboratory  
Taxonomy  
Toxicology  
Consulting  
Medicine

Private and public schools  
Colleges, universities, and agricultural colleges  
Federal agencies including  
Departments of Agriculture and Interior  
Private research foundations  
Museums  
Botanical gardens and arboretums  
Zoos and aquariums  
State and local agencies  
Public health laboratories  
Hospitals  
Oil companies  
Organizations involved in ecological studies  
National and international environmental  
research programs

- Become certified/licensed for public school teaching.
- Earn a Ph.D. for college and university teaching and advanced research and management positions.
- Develop excellent laboratory skills.
- Develop foreign language abilities for international opportunities.

## OCCUPATIONS

## EMPLOYERS

## SKILLS TO DEVELOP

### **ENTOMOLOGY**

Teaching  
Research  
Biological Control  
Toxicology  
Biological Survey  
Extension  
Inspection

Chemical companies  
Pest control companies  
Federal and state government  
Health agencies  
Agricultural experiment stations  
Inspection agencies and control boards  
Conservation agencies  
Museums  
Colleges and universities, especially colleges of agriculture and veterinary medicine  
Industry including food producers and processors, chemicals for insect control, and lumber and pulp

- Acquire a Ph.D. for college and university teaching and advanced research and management positions.
- Specialize in a particular area.

### **MARINE AND AQUATIC BIOLOGY**

Food  
Research  
Inspection  
Teaching

Federal, state, and local agencies  
International agencies  
Inspection organizations  
Private recreation organizations  
Research laboratories  
Colleges and universities  
Zoos  
Armed services  
Shipping industry  
Manufacturing  
Fish hatcheries and organizations raising fish

- Develop a good foundation in mathematics, computer science, statistics, and humanities.
- Acquire a Ph.D. for college and university teaching and advanced research and management positions.
- Obtain experience related to fishing and boating.
- Specialize in fisheries science.

### **ZOOLOGY**

Animal Care/Training  
Animal Behavior  
Research  
Curator  
Teaching

Wildlife preserves and parks  
Zoos, aquariums, and other collections of animals  
Museums  
Research organizations  
Pharmaceutical, chemical, and agricultural service industries  
Federal and state agencies  
Colleges and universities

- Acquire excellent communication skills.
- Obtain experience working with animals and various related laboratory equipment.
- Develop a broad background in biology and other related subjects such as chemistry, physics, mathematics, and statistics.
- Acquire a graduate degree for advancement and specialized positions.
- Obtain a Ph.D. for teaching and advanced research and management positions.
- Complete a related internship at a zoo or aquarium.

## OCCUPATIONS

## EMPLOYERS

## SKILLS TO DEVELOP

### **BIOMEDICAL**

Physiology  
Biophysics  
Biochemistry  
Pharmacology  
Nutrition  
Immunology  
Pathology  
Research  
Teaching  
Quality Control  
Engineering

Colleges and universities  
Professional schools including colleges of pharmacy, dentistry, medicine, veterinary medicine, and agriculture  
Clinics and hospitals  
Private research foundations  
Drug companies  
Federal laboratories and regulatory agencies  
Independent testing laboratories  
Public health departments  
Agricultural experiment stations  
Industrial laboratories including chemical, petroleum, food processing, drug, and cosmetic manufacturers  
Armed services

- Obtain a Ph.D. for college and university teaching and advanced research positions.
- Acquire a background in physics, organic and physical chemistry, mathematics, and anatomy.
- Take courses in area(s) of specialization.
- Acquire advanced degrees in areas of specialization; some may require an M.D.
- Obtain a degree in biomedical engineering or engineering technology.

### **TECHNICAL AND PHARMACEUTICAL SALES**

Manufacturing firms including pharmaceuticals, animal pharmaceuticals, laboratory equipment, medical supplies and prostheses

- Develop excellent communication and interpersonal skills.
- Take courses in anatomy, pharmacology, and chemistry.
- Obtain retail or sales experience.
- Take business classes such as marketing, accounting, finance.
- Hold leadership positions in campus organizations.
- Join the student American Marketing Association.

### **BIOINFORMATICS**

Biotechnology industry  
Pharmaceutical companies  
Government research laboratories  
Universities

- Double major or minor in computer science.
- 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.

### **TECHNICAL WRITING**

Editing  
Writing

Newspapers  
Publishing companies including scientific magazines, professional journals, periodicals, textbooks, and online publishers

- Take technical writing classes.
- Develop strong writing skills and command of the English language.
- Minor in English.
- Acquire word processing and desktop publishing skills.

## OCCUPATIONS

## EMPLOYERS

## SKILLS TO DEVELOP

### **EDUCATION**

Teaching  
Elementary  
Secondary  
Post-secondary  
Non-classroom education

Public and private schools, K-12  
Museums  
Zoos  
Nature centers  
Parks  
Public and private elementary, middle, and high schools  
Two-year community colleges/technical institutes  
Four-year institutions  
Medical schools

- Certification is required for public school teaching positions.
- Gain experience working with students through tutoring or volunteering.
- Learn to work well with all types of people.
- Develop excellent interpersonal and public speaking skills.
- Complete an accredited teacher preparation program for certification/licensure in biology and/or chemistry.
- Ph.D. required for college or university teaching.
- Some teaching positions in two-year institutions may be available for those with a master's degree.
- Prepare to attend graduate school by maintaining a high grade point average and securing strong faculty recommendations.
- Serve as a tutor for high school or college students.
- Learn to communicate effectively.

### **BIOLOGICAL PHOTOGRAPHY.**

Major medical, dental and veterinary schools  
Research centers  
Federal government  
Museums  
Zoological societies  
Publishing houses  
Free-lance

- Acquire thorough knowledge of photographic procedures and technology.
- Become skilled with medical and scientific instruments including microscopes.
- Take specific courses in biological, medical and ophthalmic photography; courses in illustration and printing are also helpful

### **LEGISLATION/LAW**

Lobbying  
Regulatory Affairs  
Science Policy  
Congressional Fellows  
Patent Law  
Environmental Law

Federal and state government  
Law firms  
Large corporations

- Acquire internships in federal or state government.
- Develop excellent communication and interpersonal skills.
- Acquire a Ph.D for more opportunities.
- Earn a law degree.

### **ILLUSTRATION**

Publishing companies of textbooks and scientific magazines or books  
Medical and veterinary colleges

- Double major or minor in art
- Find a part-time, summer, co-op or internship position with a publisher.

## **Strategies For Placement In Biology**

- A bachelor's degree will qualify one for work as a laboratory assistant, technician, technologist, or research assistant. These individuals work as part of a team performing practical operations, e.g., operating laboratory equipment, designing and constructing new equipment, making drawings, building models and assisting in the interpretation of results.
- The biological sciences are good preparation for a career in healthcare including medicine, dentistry, nursing, etc.
- An undergraduate degree can be used for nontechnical work in writing, illustration, sales, photography, and legislation.
- Graduate degrees allow for more responsibility and advancement.
- Some work environments, particularly medical, require special certification.
- Learn laboratory procedures and become familiar with equipment.
- Obtain summer, part-time, volunteer, co-op, or internship experience.
- Complete various training courses working with laboratory equipment and procedures to enhance job skills and abilities.
- Join professional associations and community organizations to enhance knowledge, abilities and contacts in the field. Read scientific journals.
- 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.
- Plan on 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.

## **Internet Resources:**

Vault: more information on the every day life of a biologist. This site is accessible through the Career Services Website: [www.capital.edu/careers](http://www.capital.edu/careers)

Industry Profile - Biotechnology, Medicine and Health: [www.wetfeet.com/asp/careerlist.asp](http://www.wetfeet.com/asp/careerlist.asp)

Covers Industry Trends & Overview, "Love-Hate" (pros and cons of this field), Major Players and Job Descriptions & Tips.