“The Biology Department offers a biology major in which a WSU student may select one of five options: allied health, cell and molecular, ecology, environmental science, or life science (teaching). Each of these options leads to a B.S. degree and allows for many career opportunities. Many graduates pursue additional education in disciplines such as biology, biochemistry, medicine, physical therapy, dentistry, and veterinary medicine. Other graduates use the B.S. degree in biology to gain employment in the rapidly expanding field of health care research or in more traditional areas such as wildlife and environmental management. The life science major prepares students for teaching at the middle school and high school levels.” (Winona State University Biology Department, n.d.)

A Biology degree can offer you opportunities to begin the educational process for more advanced positions such as medicine, dentistry, pharmacy, education and other careers. This degree contains experiences with biological and medical sciences through the study of living systems. Many of the biological careers require further education beyond a Bachelor’s degree. (DISCOVER, n.d.)

The National Association of Colleges and Employers (2011) reports that hiring for the Class of 2011 (all majors) nationally is up 5.9% with an average salary offer of $50,462. Hiring for the Midwest region is reported by The Collegiate Employment Research Institute (2010) as also increasing by 10% for Bachelor graduates with an average salary of $36,866, which is down from the past two years. The Midwest Colleges and Employers Association (2010) reports regional (12 state Midwest region) hiring is increasing by 9% with an average starting salary of $35,453 for all Bachelor degree recipients.

<table>
<thead>
<tr>
<th>AREAS</th>
<th>EMPLOYERS</th>
<th>PREPARATION</th>
</tr>
</thead>
</table>
| ALLIED HEALTH          | **PRE-PROFESSIONAL SEQUENCES:**  
                        | - These programs are preparatory for a degree at another college or university.              | ❖ With few exceptions, schools for these degrees require completion of a bachelor's degree or its equivalent before admission. Students follow the pre-medical curriculum described under the Biology: Allied Health program. |
|                        | **ALLIED HEALTH**  
                        | - Pre-Dentistry  
                        | - Pre-Optometry  
                        | - Pre-Physical Therapy  
                        | - Pre-Physician Assistant  
                        | - Pre-Podiatry  |                                                                 |
|                        | Hospital and private laboratories  
                        | Biotechnology industry  
                        | Research and forensic laboratories  
                        | Public health laboratories  
                        | Lab industry sales and product development  
                        | Universities and colleges  
                        | Pharmaceutical companies  
                        | Armed forces  |                                                                 |
| MEDICAL TECHNOLOGY     | Hospital and private laboratories  
                        | Biotechnology industry  
                        | Research and forensic laboratories  
                        | Public health laboratories  
                        | Lab industry sales and product development  
                        | Universities and colleges  
                        | Pharmaceutical companies  
                        | Armed forces  | ❖ Earn a bachelor’s degree in medical technology.  
                        | ❖ Be prepared to participate in supervised clinical experiences.  
                        | ❖ Many states require a license to practice. Obtain licensure by passing a certification exam given the NCA or ASCP.  
                        | ❖ Attain good grades in pre-medical technology course work, including biology, anatomy, physiology, and general and organic chemistry.  
                        | ❖ Develop manual dexterity, fine motor skills, and an attention to detail.  
                        | ❖ Visit a clinical laboratory. Talk with practitioners to gain critical knowledge.  |
|                        | **MEDICAL TECHNOLOGY**  
                        | - Blood Banking  
                        | - Microbiology  
                        | - Hematology  
                        | - Chemistry  
                        | - Immunology  
                        | - Urinalysis  
                        | - Molecular Biology  |                                                                 |
|                        | Colleges and universities  
                        | Pharmaceutical companies  
                        | Agricultural industry including fertilizer manufacturers and animal and plant breeding and production  
                        | Federal and state government laboratories and agencies  | ❖ Develop excellent laboratory skills.  
                        | ❖ Acquire a Ph.D. for college and university teaching and advanced positions in research, development, and management.  
                        | ❖ Take additional courses in science and mathematics.  
                        | ❖ Learn to problem solve.  
                        | ❖ Develop work habits that are systematic, precise, and patient.  |
| BIOTECHNOLOGY          | Colleges and universities  
                        | Pharmaceutical companies  
                        | Agricultural industry including fertilizer manufacturers and animal and plant breeding and production  
                        | Federal and state government laboratories and agencies  |                                                                 |
|                        | **BIOTECHNOLOGY**  
                        | - Research and Development  
                        | - Laboratory Testing  
                        | - Teaching  |                                                                 |
## BIOLOGY: ALLIED HEALTH
### What can I do with this degree?

<table>
<thead>
<tr>
<th>AREAS</th>
<th>EMPLOYERS</th>
<th>PREPARATION</th>
</tr>
</thead>
</table>
| GENETICS | • 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 | ♦ Acquire a broad background in sciences, mathematics, and computer technology.  
♦ Obtain a Ph.D. for advanced positions in research and management.  
♦ Earn a master’s degree from an accredited program for genetic counseling. |
| MICROBIOLOGY | • 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. |
STRATEGIES

• A bachelor’s degree will qualify you for work as a laboratory assistant, technician, technologist, or research assistant.
• The biological sciences are good preparation for a career in healthcare including medicine, dentistry, nursing, etc.
• Graduate degrees allow for more responsibility and advancement. Plan on completing a post doctoral experience after graduate school.
• 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.
• Learn federal, state, and local government job application process. The federal government is the largest employer of biologists.

LINKS

A Lifetime with Science from The American Institute of Biological Sciences
American Society for Clinical Laboratory Science - Careers
American Society for Cytotechnology
Careers in Allied Health
Dolphin Research Center
Science Technicians from the Occupational Outlook Handbook
Clinical Laboratory Technologists and Technicians from the Occupational Outlook Handbook
Healthcare Career Resource Center
Science Careers
Science Jobs
Careers in Marine Science
Biological and Medical Scientists from the Occupational Outlook Handbook

Prepared by the Career Planning staff of Career Services at The University of Tennessee, Knoxville. (2003)

The following is a representative sample of types of job positions relating to biology in the health and medical fields (not all possible options are listed):

Biologist

Biologists are growing annually at a moderate rate of 1.2% (Economic Research Institute, 2010). Nationally there are 16,300 employed positions with an annual national salary averaging $65,000 (United States Department of Labor, 2009). In Minnesota there are 270 employed positions with an annual state salary averaging $68,500. Starting salaries average $42,500 nationally and average $43,500 in Minnesota. Non-research degrees require a Bachelor’s Degree but research positions typically require at least a Master’s Degree and even more often a Doctoral Degree (DISCOVER, n.d.).

Dentist

Biology majors may be pre-Dentistry with intentions to continue with higher education. Dentists are expected to grow annually at a moderate rate of 1.6% (Economic Research Institute, 2010). The annual national salary averages $160,000 and in Minnesota averages $168,500 (United States Department of Labor, 2009). Currently there are 92,300 jobs in the nation and 1,420 jobs in Minnesota. Starting salaries average $104,000 nationally and average $108,000 in Minnesota. Dentists must be licensed and complete post-Bachelor education (DISCOVER, n.d.).
Physician
Physicians also continue on with more education and are expected to grow annually at a rapid rate of 2.2% (Economic Research Institute, 2010). Currently there are 99,000 employed physicians in the nation and 3,530 employed in Minnesota (United States Department of Labor, 2009). The annual national salary averages $177,500 and averages $187,000 in Minnesota. Starting annual salaries average $199,500 nationally and average $126,000 in Minnesota. A Doctoral degree is required (DISCOVER, n.d.).

Surgeon
Surgeons as well continue on to medical school and are increasing annually at a rapid rate of 2.2% (Economic Research Institute, 2010). In the nation there are 50,000 jobs employed and in Minnesota there are 1,420 (United States Department of Labor, 2009). The national annual salary averages $260,000 and in Minnesota averages $273,500. Starting annual salaries average $174,500 nationally and average $183,500 in Minnesota. A Doctoral degree is required (DISCOVER, n.d.).

College/University Faculty
College and University faculty are growing annually at a moderate rate of 1.5% (Economic Research Institute, 2010). There are 1,387,000 positions nationwide and average an annual salary of $64,500 (United States Department of Labor, 2009). In Minnesota there are 22,430 positions that average an annual salary of $68,000. Starting salaries average $48,500 annually nationwide and average $45,500 in Minnesota. Generally a Doctoral Degree is required with instances of Master’s Degree graduates being hired (DISCOVER, n.d.).

Coroner
Coroner is a position that is growing annually at a rapid rate of 3.1% (Economic Research Institute, 2010). Nationally there are 166,900 positions that average an annual salary of $54,000 (United States Department of Labor, 2009). In Minnesota there are 3,960 positions that average an annual salary of $57,000. Starting salaries average $43,000 nationally and average $45,500 in Minnesota. Depending on jurisdiction and law, the Coroner may not need to be trained in medicine or be a physician (DISCOVER, n.d.).

Science Technician
Science Technicians are growing annually at a moderate rate of 1.5% (Economic Research Institute, 2010). There are 118,100 positions in the nation and 1,280 positions in Minnesota (United States Department of Labor, 2009). The annual national salary averages $54,000 and averages $57,000 in Minnesota. Starting salaries average $43,500 nationally and average $46,000 in Minnesota. Most employers require at least 2 years of training and many prefer Bachelor Degrees (DISCOVER, n.d.).

Radiologist
Radiologists are expected to grow annually at a rapid rate of 2.2% (Economic Research Institute, 2010). Nationally there are 99,000 positions filled and average an annual salary of $296,500 (United States Department of Labor, 2009). In Minnesota there are 3,530 positions employed and average an annual salary of $312,000. Starting salaries average $210,500 nationally and average $221,500 in Minnesota. A Doctoral degree is required (DISCOVER, n.d.).

For additional information please visit the websites below:

- Career One Stop: http://www.careeronestop.org/
- O*Net Online: http://www.onetonline.org/

What can I do with this degree?