

CAREER GUIDE FOR BIOLOGICAL TECHNICIANS

SOC Code: 19-4021

Pay Band(s): 1, 2, and 3 ([Salary Structure](#))

Standard Occupational Description: Assist biological and medical scientists in laboratories. Set up, operate, and maintain laboratory instruments and equipment, monitor experiments, make observations, and calculate and record results. May analyze organic substances, such as blood, food, and drugs.

Biological Technician positions in the Commonwealth are primarily assigned to two Career Groups:

[Laboratory and Research Services Career Group:](#)

- [Laboratory and Research Aide](#)
- [Laboratory and Research Technician](#)
- [Laboratory and Research Specialist I](#)

[Natural Resources Career Group:](#)

- [Natural Resources Specialist II](#)
- [Natural Resources Specialist III](#)

Individuals interested in related career opportunities as science technicians or in advanced careers in biology may want to consider the following Career Groups:

[Agricultural Services](#)

[Environmental Services](#)

[Minerals Regulatory Services](#)

[Life and Physical Science](#)

[Veterinary Science](#)

SKILLS, KNOWLEDGE, ABILITIES AND TASKS

(Technical and Functional Expertise)

Skills

Note: *The technical and functional skills listed below are based on general occupational qualifications for **Biological Technicians** commonly recognized by most employers. Typically, you will not be required to have all of the skills listed to be a successful performer. Recruitment and selection standards for an individual state job must be based on the specific knowledge, skills, and abilities for that job as indicated in the job announcement and job description in the Employee Work Profile.*

1. Using scientific rules and methods to solve problems.
2. Using mathematics to solve problems.
3. Understanding written sentences and paragraphs in work related documents.
4. Controlling operations of equipment or systems.

Knowledge

Note: The technical and functional knowledge statements listed below are based on general occupational qualifications for **Biological Technicians** commonly recognized by most employers. Typically, you will not be required to have all of the knowledge listed to be a successful performer. Recruitment and selection standards for an individual state job must be based on the specific knowledge, skills, and abilities for that job as indicated in the job announcement and job description in the Employee Work Profile.

The **Knowledge** of:

1. Plant and animal organisms, their tissues, cells, functions, interdependencies, and interactions with each other and the environment.
2. Arithmetic, algebra, geometry, calculus, statistics, and their applications.

Abilities

Note: The technical and functional abilities listed below are based on general occupational qualifications for **Biological Technicians** commonly recognized by most employers. Typically, you will not be required to have all of the abilities listed to be a successful performer. Recruitment and selection standards for an individual state job must be based on the specific knowledge, skills, and abilities for that job as indicated in the job announcement and job description in the Employee Work Profile.

The **Ability** to:

1. Listen to and understand information and ideas presented through spoken words and sentences.
2. Communicate information and ideas in writing so others will understand.
3. Tell when something is wrong or is likely to go wrong. It does not involve solving the problem, only recognizing there is a problem.
4. Generate or use different sets of rules for combining or grouping things in different ways.

Tasks

Note: The following is a list of sample tasks typically performed by **Biological Technicians**. Employees in this occupation will not necessarily perform all of the tasks listed.

1. Analyze experimental data and interpret results to write reports and summaries of findings.
2. Clean, maintain and prepare supplies and work areas.
3. Conduct, or assist in conducting, research, including the collection of information and samples, such as blood, water, soil, plants and animals.
4. Conduct standardized biological, microbiological and biochemical tests and laboratory analyses to evaluate the quantity or quality of physical or chemical substances in food and other products.
5. Examine specimens to detect the presence of disease or other problems.
6. Feed livestock and laboratory animals.
7. Measure or weigh compounds and solutions for use in testing or animal feed.
8. Monitor and observe experiments, recording production and test data for evaluation by research personnel.
9. Provide technical support and services for scientists and engineers working in fields such as agriculture, environmental science, resource management, biology, and health sciences.
10. Set up, adjust, calibrate, clean, maintain, and troubleshoot laboratory and field equipment.

INTERESTED?

Like people, occupations have traits or characteristics. These characteristics give important clues about the nature of the work and work environment, and give you an opportunity to match your own personal interests to a specific occupation. When you choose a job in an occupation that matches your own interests you have taken an important step in planning a successful and rewarding career.

Occupations in biology are considered **Realistic** because they frequently involve work activities that include practical, hands-on problems and solutions. They often deal with plants, animals, and real-world materials like wood, tools, and machinery. Many of the occupations require working outside, and do not involve a lot of paperwork or working closely with others.

They are also considered **Investigative** because they frequently involve working with ideas, and require an extensive amount of thinking. These occupations can involve searching for facts and figuring out problems mentally.

They are also **Conventional** because they frequently involve following set procedures and routines. These occupations can include working with data and details more than with ideas. Usually there is a clear line of authority to follow.

LICENSURE, REGISTRATION, OR CERTIFICATION REQUIREMENTS

Generally this is not required for biological technician positions in state government. However, if you're interested in career opportunities in biology or a related field of study you should consider including certification and/or licensure in your self-development plan.

The National Accrediting Agency for Clinical Laboratory Science (NAACLS) is committed to being the premier international agency for accreditation and approval of education programs in the clinical laboratory sciences and related health care professions. Accredited programs include Clinical Laboratory Scientist/Medical Technologist, Clinical Laboratory Technician/Medical Laboratory Technician, Cytogenetic Technologist, Histologic Technician, Histotechnologist, and Pathologists' Assistant.

For more information on accredited programs and professions visit the NAACLS web site at <http://www.naacls.org/>

The American Society for Clinical Laboratory Science (ASCLS) promotes the profession of clinical laboratory science and provides beneficial services to those who practice it. To enable its members to provide quality services for all consumers, the society is committed to the continuous quest for excellence in all its activities. To learn more you can visit the ASCLS's web site at <http://www.ascls.org>

EDUCATIONAL, TRAINING, AND LEARNING OPPORTUNITIES

From the Department of Labor's Occupational Outlook Handbook:

Biological technicians work with biologists studying living organisms. Many assist scientists who conduct medical research, helping to find a cure for cancer or AIDS, for example. Those who work in

pharmaceutical companies help develop and manufacture medicinal and pharmaceutical preparations. Those working in the field of microbiology generally work as lab assistants, studying living organisms and infectious agents. Biological technicians also analyze organic substances, such as blood, food, and drugs, and some examine evidence in a forensic science laboratory. Biological technicians working in biotechnology labs use the knowledge and techniques gained from basic research by scientists, including gene splicing and recombinant DNA, and apply them in product development.

Many employers prefer applicants who have at least 2 years of specialized training or an associate degree in applied science or science-related technology. Because employers' preferences vary, however, some science technicians have a bachelor's degree in chemistry, biology, or forensic science, or have taken several science and math courses at 4-year colleges.

Sources of educational, training, and learning opportunities include:

Virginia Commonwealth University
<http://www.vcu.edu>

Virginia Tech
<http://www.vt.edu>

Virginia Community Colleges System
<http://www.vccs.edu>

COMMONWEALTH COMPETENCIES

Competencies are a set of identified behaviors, knowledge, skills, and abilities that directly and positively impact the success of employees and the organization. Competencies can be observed and measured. When consistently demonstrated, competencies make employees particularly effective in their work. Competencies help lay out a road map to career success. You can use the Commonwealth Competencies to help improve your individual performance by adopting behaviors that make high performing employees successful in their jobs. In this way, you can use the Commonwealth Competencies for your further professional development.

The Commonwealth Competencies are:

1. Technical and Functional Expertise
2. Understanding the Business
3. Achieving Results
4. Serving the Customer
5. Teamwork
6. Interpersonal and Communication Skills
7. Leadership and Personal Effectiveness

The above competencies may be applied to employees throughout the Commonwealth of Virginia. They can be rank-ordered by agencies and hiring managers to represent the needs of a specific job. The rank ordering will change depending upon the occupation, an organization's priorities, the actual job requirements, and the supervisor's preferences.

Career success is both about what you do (applying your technical knowledge, skills, and ability) and how you do it (the consistent behaviors you demonstrate and choose to use) while

interacting and communicating with others. Hopefully, by studying the Commonwealth competencies, identifying your developmental opportunities, and working to refine your own competence, you can take charge of your career!

For additional information about the **Commonwealth Competencies** go to: http://jobs.state.va.us/cc_planningctr.htm. For the competencies, we first list the competencies and then define each. Finally, we list competency indicators; to describe what successful performance looks like.

COMMONWEALTH CAREER PATH

Career opportunities in the Commonwealth are not limited to moving “up” to the next highest role and pay band, changing positions, or to becoming a supervisor. That’s because most roles describe a broad group of occupationally related positions that perform a range of work that requires increased knowledge and skills. For that reason, Commonwealth roles describe the career paths within the same or higher-level role for the same or different Career Group. The broad salary range and the Commonwealth’s pay practices provide flexibility in recognizing career development and advancement. ([Salary Structure](#))

For example:

Pay Band	Practitioner Roles	Management Roles
1	Laboratory and Research Aide	
2	Laboratory and Research Technician	
3	Laboratory and Research Specialist I	
4	Laboratory and Research Specialist II	
5		Laboratory and Research Manager

Sample Career Path

Laboratory and Research Aide

The Laboratory and Research Aide role provides career tracks for laboratory aides and laboratory animal caretakers who follow a highly structured schedule in performing simple, repetitive tasks under the immediate supervision of higher-level laboratory, or research personnel. Typical duties include washing and sterilizing glassware and equipment; receiving, distributing and preparing packages, samples and supplies; preparing sample test kits, and preparing media.

Laboratory and Research Technician

The Laboratory and Research Technician role provides career tracks for laboratory technicians, geological technicians, and laboratory animal caretakers that perform a variety of laboratory and/or research tasks in support of research/teaching, clinical services, geological services, field research or a regulatory laboratory. Employees are responsible for a variety of standard procedures that range from routine to specialized in the areas of cleaning and decontamination;

media preparation; performing standard/routine laboratory testing; sectioning and preparing rock and mineral samples for various mineralogical and laboratory analyses; preparing samples; assisting in autopsy, necropsy, or routine surgical procedures; maintaining animal health and welfare; recording data, and operating and maintaining tools and equipment.

Laboratory and Research Specialist I

The Laboratory and Research Specialist I role provides career tracks for autopsy technicians, laboratory specialists, research specialists, assistants to chemists, microbiologists and other scientists who support in the performance of various technical, scientific, analytical or animal care activities for clinical, research, regulatory or laboratory programs, or in a veterinary hospital or animal care facility. Laboratory and research support responsibilities range from journey-level to advanced.

Laboratory and Research Specialist II

The Laboratory and Research specialist II role provides career tracks for both employees who are laboratory specialists and research specialists performing advanced to expert level responsibilities and for supervisors in a laboratory, field setting, animal care facility or for scientific research. The first track is for positions conducting complex scientific procedures or research for a laboratory or program manager, principal investigator or project director. The second track is for laboratory and research specialists who continue to deliver scientific services while assuming additional supervisory and administrative responsibilities.

Laboratory and Research Manager

The Laboratory and Research Manager role provides career tracks for managers of laboratories in a teaching, research, clinical, service or regulatory setting. Employees are responsible for making administrative decisions related to all laboratory operations and exercise broad-based administrative responsibility for all laboratory functions and personnel.

For Example:

PAY BAND	PRACTITIONER ROLES	MANAGEMENT ROLES
2	Natural Resource Specialist I	
3	Natural Resource Specialist II	
4	Natural Resource Specialist III	Natural Resource Manager I
5	Natural Resource Specialist IV	Natural Resource Manager II
6		Natural Resource Manager III

Natural Resource Specialist I

The Natural Resource Specialist I role provides career tracks for wildlife workers and forestry workers performing entry-level to lead work in providing skilled support in a variety of tasks for the propagation, replenishment and conservation of aquatic or terrestrial natural resources. Employees perform manual tasks using hand and power tools, operate and maintain equipment and machinery, and apply competencies in trades and utilities in the performance of duties.

Natural Resource Specialist II

The Natural Resource Specialist II role provides career tracks for forestry/wildlife biologist/fisheries assistants or park rangers involved in a variety of skilled, technical or compliance functions in conservation, forestry, marine and fisheries operations, parks, wildlife projects, or program development that provide support and require some independence of action. Employees perform work that range from entry-level technician to Chief Park ranger with supervisory responsibilities.

Natural Resource Specialist III

The Natural Resource Specialist III role provides career tracks for foresters, assistant park superintendents, and other specialists that provide senior technical support or serve as professional specialists or supervisors in resource management protection, customer relations and education, recreation, and/or research projects and programs. The work involves inventory, data collection, and resource analysis; developing management plans based on technical/scientific principles and practices; prescribing solutions to resource management problems; staff development; supervising resource management programs and budgets; and developing narrative and/or statistical reports.

Natural Resource Specialist IV

The Natural Resource Specialist IV role provides career tracks for advanced-level professional specialists located in a central or field office that provide internal and external customer services to natural resource programs statewide. Employees consult on silviculture and forest management, health, and protection; watershed management and water quality; marketing and wood utilization; forest renewal, research or demonstration programs or projects, urban/community forestry or conservation education. Work involves the ability to manage multiple program priorities.

Natural Resource Manager I

The Natural Resource Manager I role provides career tracks for managers of staff in a natural resource facility or geographic area for which they have program management responsibility. Employees typically perform related program administrative functions such as hiring and training staff, preparing and monitoring budgets, overseeing procurement, collecting revenues, and/or inspecting or overseeing small capital outlay projects. Employees typically manage fish hatcheries, state parks of small to moderate program complexity, a forestry center, a group of wildlife management areas, or a natural resource district.

Natural Resource Manager II

The Natural Resource Manager II role provides career tracks for managers of regional or statewide forest management and protection operations or programs requiring subject area expertise and managerial competencies, a major state park operation with multiple programs and services, or statewide park districts. May manage enforcement of resource protection policies, regulations and laws. Some employees are responsible for programs with multiple components, managed through subordinate supervisors.

Natural Resource Manager III

The Natural Resource Manager III role provides career tracks for managers who serve as directors or assistant directors for a major natural resource division comprised of multiple programs. Employees typically manage on a statewide basis in forestry, marine resource, natural heritage, state parks, or watershed management.

ADDITIONAL OCCUPATIONAL INFORMATION CAN BE FOUND AT:

O*NET (Occupational Information Network)
http://online.onetcenter.org/gen_search_page

Virginia Employment Commission
<http://www.alex.vec.state.va.us/>

Career One Stop
<http://www.careeronestop.org/>

Virginia Career Resource Network
<http://www.vacrn.net/>