PROGRAMS OF STUDY

This document is a Program of Study for Health Professions and Related Clinical Sciences programs at the secondary level. This program of study is considered a framework, not a curriculum. From this framework educators may use this as a tool to provide structure for developing learning modules, unit plans, or daily lesson plans that meet the tasks or standards within the program of study. This program of study is based on research, experience, and many resources. The goal is to train a workforce that is skilled, knowledgeable, and able to meet the needs of the industry today and well into the future.

Clinical laboratory testing plays a crucial role in the detection, diagnosis, and treatment of disease. Clinical laboratory technologists – also referred to as clinical laboratory scientists or medical technologists – and clinical laboratory technicians, also known as medical technicians or medical laboratory technicians, perform most of these tests.

Clinical laboratory personnel examine and analyze body fluids and cells. They look for bacteria, parasites, and other microorganisms; analyze the chemical content of fluids; match blood for transfusions; and test for drug levels in the blood that show how a patient is responding to treatment. Technologists also prepare specimens for examination, count cells, and look for abnormal cells in blood and body fluids. They use microscopes, cell counters, and other sophisticated laboratory equipment. They also use automated equipment and computerized instruments capable of performing a number of tests simultaneously. After testing and examining a specimen, they analyze the results and relay them to physicians.

With increasing automation and the use of computer technology, the work of technologists and technicians has become less hands-on and more analytical. The complexity of tests performed, the level of judgment needed, and the amount of responsibility workers assume depend largely on the amount of education and experience they have. Clinical laboratory technologists usually do more complex tasks than clinical laboratory technicians do.

Clinical laboratory technologists evaluate test results, develop and modify procedures, and establish and monitor programs, to ensure the accuracy of tests. Some technologists supervise clinical laboratory technicians.

Clinical laboratory technicians perform less complex tests and laboratory procedures than technologists do. Technicians may prepare specimens and operate automated analyzers, for example, or they may perform manual tests in accordance with detailed instructions. They usually work under the supervision of medical and clinical laboratory technologists or laboratory managers. Like technologists, clinical laboratory technicians may work in several areas of the clinical laboratory or specialize in just one. Phlebotomists collect blood samples, for example, and histotechnicians cut and stain tissue specimens for microscopic examination by pathologists.

Clinical laboratory personnel are trained to work with infectious specimens. When proper methods of infection control and sterilization are followed, few hazards exist. Protective masks, gloves, and goggles often are necessary to ensure the safety of laboratory personnel.

Working conditions vary with the size and type of employment setting. Laboratories usually are well lighted and clean; however, specimens, solutions, and reagents used in the laboratory sometimes produce fumes. Laboratory workers may spend a great deal of time on their feet. Hours of clinical laboratory technologists and technicians vary with the size and type of employment setting. In large hospitals or in independent laboratories that operate continuously, personnel usually work the day, evening, or night shift and may work weekends and holidays. Laboratory personnel in small facilities may work on rotating shifts, rather than on a regular shift. In some facilities, laboratory personnel are on call several nights a week or on weekends, in case of an emergency.

The usual requirement for an entry-level position as a clinical laboratory technologist is a bachelor's degree with a major in medical technology or one of the life sciences; however, it is possible to qualify for some jobs with a combination of education and on-the-job and specialized training. The Clinical Laboratory Improvement Act requires technologists who perform highly complex tests to have at least an associate degree.

Medical and clinical laboratory technicians generally have either an associate degree from a community college or a certificate from a hospital, a career and technical school, or the Armed Forces. A few technicians learn their skills on the job.

Many employers prefer applicants who are certified by a recognized professional association. In addition to certification, employers seek clinical laboratory personnel with good analytical judgment and the ability to work under pressure. Technologists in particular are expected to be good at problem solving. Close attention to detail is also essential for laboratory personnel because small differences or changes in test substances or numerical readouts can be crucial to a diagnosis. Manual dexterity and normal color vision are highly desirable, and with the widespread use of automated laboratory equipment, computer skills are important.

Assumptions of This Program of Study

High-quality programs should meet the following standards:
- Promote **positive working relationships**
- Implement a **curriculum** that fosters all areas of skill development – cognitive, emotional, language, physical, and social
- Use developmentally, culturally, and linguistically appropriate and **effective teaching approaches**
- Provide **ongoing assessments** of student progress
- Employ and support qualified **teaching staff**
- Establish and maintain collaborative relationships **with families**
- Establish and maintain relationships and use resources of the **community**
- Provide a safe and healthy learning **environment**
- Implement strong program organization and supervision policies that result in **high-quality teaching and learning**
- Integrate academic skills and aptitudes necessary for gainful employment and promoting a foundation of **lifelong learning**

Academic Rigor

Research shows that career success requires the same level of college-prep courses as postsecondary success requires. The Department of Education's focus is to ensure that every student graduates prepared for college and a career. In order to be successful in this program of study, students should follow the academic sequence as determined by Pennsylvania's high school reform efforts.

Resources Used for This Program of Study

- MAVCC (Multistate Academic Vocational Curriculum Consortium) http://www.mavcc.org/
- NOCTI (National Occupational Competency Testing Institute http://www.nocti.org/
- O*NET http://online.onetcenter.org/
- Pennsylvania Approved Certifications for Industry-Recognized Certifications for Career and Technical Education Programs http://www.portal.state.pa.us/portal/server.pt/community/instructional_resources/7392/industry-recognized_certifications_for_career_and_technical_education_programs/507887
- Pennsylvania Department of Labor & Industry High Priority Occupations http://www.portal.state.pa.us/portal/server.pt/community/high_priority_occupations/12910
- VTECS (A Consortium of Innovative Career and Workforce Development Resources) http://www.vtecs.org/

CIP Code

51.9999   HEALTH PROFESSIONS AND RELATED CLINICAL SCIENCES

Pennsylvania CIP
A cluster program designed for individuals whose career objective is one within the technical allied health field. The program is designed to promote careers in health care and to permit graduates to pursue postsecondary education. In addition, the program requires a concentration of planned courses in mathematics and science. Basic health occupation instruction introduces field experience in extended classrooms within settings concerned with technical functions to obtain data for use in diagnosis, treatment and control of disease. Instruction may also include the use of technical equipment.

The health occupational core instruction includes planned courses in medical terminology, anatomy and physiology, clinical laboratory procedures, basic clinical skills, aseptic techniques, OSHA regulations and infection control. Clinical education is an integral part of the program. Science and math taught by certificated science and math teachers will be coordinated and deemed essential for students to successfully reach their career objectives.

Integrate Academic Career Education and Work Standards for Student Success

As students participate in career exploration activities and rigorous studies from elementary grades through graduation, they learn to appreciate the relationship between their classroom learning and the skills needed within the workplace. The academic and workplace skills within the Academic Standards for Career Education and Work are expected to be addressed within classrooms and achieved by all students throughout Pennsylvania. No student should leave secondary education without a solid foundation in these Standards.
http://www.portal.state.pa.us/portal/server.pt/community/state_board_of_education/8830/state_academic_standards/529102

CEW Standards Tool Kit for teachers to implement CEW Standards
www.pacareerstandards.com

Pennsylvania Approved Certifications

http://www.portal.state.pa.us/portal/server.pt/community/instructional_resources/7392/industry-recognized_certifications_for_career_and_technical_education_programs/507887

Nurse Aide Training Performance Checklist
http://www.education.state.pa.us/portal/server.pt/community/nurse_aide_training_program/7685/instructor%27s_corner/507873

The Programs of Study Documents

- Crosswalk Template for Task Alignment (excel) – Health Professions and Related Clinical Sciences – Instructions: Indicate the number code(s) of your school's program competency or competencies aligned to each program of study competency.
- Crosswalk Template for Task Alignment (pdf) – Health Professions and Related Clinical Sciences – Instructions: Indicate the number code(s) of your school's program competency or competencies aligned to each program of study competency.
- Scope and Sequence Template (word) – Enter secondary technical Program of Study courses. Postsecondary courses will be determined when the Statewide Articulation Agreement for this Program of Study is complete.
- Scope and Sequence Template (pdf) – Enter secondary technical Program of Study courses. Postsecondary courses will be determined when the Statewide Articulation Agreement for this Program of Study is complete.
- PA Academic Standards/Eligible Content Alignment Task List (excel) – Health Professions and Related Clinical Sciences – Crosswalk of PA Academic Standards/ Eligible Content for Reading, Writing, Speaking and Listening (RWSL), Math, and Science aligned to Program of Study Secondary Competency List. (coming soon)
- PA Academic Standards/Eligible Content Alignment Task List (pdf) – Health Professions and Related Clinical Sciences – Crosswalk of PA Academic Standards/Eligible Content for Reading, Writing, Speaking and Listening (RWSL), Math, and Science aligned to Program of Study Secondary Competency List. (coming soon)

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