

**Florida Department of Education  
CURRICULUM FRAMEWORK**

**Program Title:** Biomedical Technician  
**Program Type:** Job Preparatory  
**Occupational Area:** Health Science Education  
**Components:** Core, One Program, One Occupational Completion Point

PSAV

**Program Number** H170206  
 CIP Number 0326010200  
 Grade Level 30, 31  
 Standard Length 1000 Clock hours  
 Certification PRAC NURSE @7 G  
 Reg Nurse G LAB TECH @7 G MED PROF G  
 PHARMACY @7 G LAB ASST @7 G

Facility Code  
 VSO: HOSA  
 Coop Method: No  
 Apprenticeship: No

**Basic Skills**

Math	12
Language	10
Reading	10

- I. **PURPOSE:** This program is designed to prepare students for employment as biomedical technicians or (biological technicians SOC 19-4021).

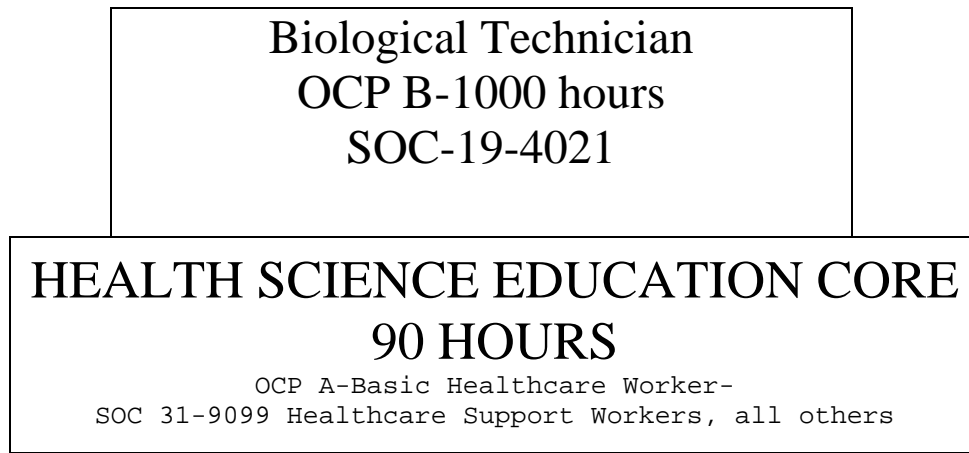
The content includes, but is not limited to, bio-tech communication and interpersonal skills, legal and ethical responsibilities, safety awareness, regulatory compliance, equipment maintenance, bio-medical terminology, anatomy and physiology, basic laboratory skills, problem solving and decision making and employability skills.

Reinforcement of basic skills in English, mathematics, and science appropriate for the job preparatory programs occurs through vocational classroom instruction and applied laboratory procedures or practice.

This program focuses on broad, transferable skills and stresses understanding and demonstration of the following elements of the health care industry; planning, management, finance, technical and production skills, underlying principles of technology, labor issues, community issues and health, safety, and environmental issues.

- II. **PROGRAM STRUCTURE:** This program is a planned sequence of instruction consisting of 2 completion points.

III. THE FOLLOWING DIAGRAM ILLUSTRATES STRUCTURE



- III. **LABORATORY ACTIVITIES:** Clinical/laboratory experiences are integrated with the didactic portion of the program.
- IV. **SPECIAL NOTE:** This program meets the Department of Health HIV/AIDS education requirements. Upon completion of this program, the instructor will provide a certificate to the student verifying that the HIV/AIDS requirements have been met.

Health Occupations Students of America, (HOSA)Inc., is the appropriate CSO (Career Student Organization) as well as participation in a career related professional organization for providing leadership training experiences and for reinforcing specific vocational skills. CSOs, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065(8), FAC.

In accordance with Rule 6A-10.040, FAC, the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 12, Language 10, Reading 10. These grade level numbers correspond to a grade equivalent score obtained on one of the state designated basic skills examinations. If a student does not meet the basic skills level required for completion from the program, remediation should be provided concurrently in the System for Applied Individualized Learning (SAIL) lab prior to admission in an Adult Basic Education (ABE) setting.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 1001.44 F.S.

**SCANS Competencies:** Instructional strategies for this program must include methods that require students to identify, organize, and use resources appropriately; to work with each other cooperatively and productively; to acquire and use information; to understand social, organizational, and technological systems; and to work with a variety of tools and equipment. Instructional strategies must also incorporate the methods to improve students' personal qualities and high-order thinking skills.

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Adult students with disabilities must self-identify and request such services. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of

the accommodations requested and provided should be maintained in a confidential file.

The standard length of the program is 1000 clock hours which includes 90 clock hours for the core.

**V. INTENDED OUTCOMES:**

Outcomes 01-11 are referred to as the Health Career Core and do not have to be completed if the student has previously completed the Core in another health occupations program. The Core should be taken first or concurrently with the first course in the program. Following the successful completion of the core, the student is eligible to take the national internet certification examination (Nocti) with instructor approval and the completion of a portfolio.

After successfully completing this program, the student will be able to:

**HEALTH SCIENCE CORE (01-11) OCP A-Basic Healthcare Worker- (SOC Code 31-9099- Healthcare Support Workers, All other)**

- 01.0 Demonstrate knowledge of the health care delivery system and health occupations.
- 02.0 Demonstrate the ability to communicate and use interpersonal skills effectively.
- 03.0 Demonstrate legal and ethical responsibilities.
- 04.0 Demonstrate an understanding of and apply wellness and disease concepts.
- 05.0 Recognize and practice safety and security procedures.
- 06.0 Recognize and respond to emergency situations.
- 07.0 Recognize and practice infection control procedures.
- 08.0 Demonstrate computer literacy.
- 09.0 Demonstrate employability skills.
- 10.0 Demonstrate knowledge of blood borne diseases, including AIDS.
- 11.0 Apply basic math and science skills.

***OCCUPATIONAL COMPLETION POINT - DATA CODE B(12.0 -20.0)***

Biological Technician SOC Code-19-4021

- 12.0 Discuss the history, career fields and benefits of biotechnology and bio-medical research.
- 13.0 Describe basic concepts and techniques necessary to work effectively in a biotechnology laboratory.
- 14.0 Demonstrate accepted professional, communication and interpersonal skills specific to the bio-medical setting.
- 15.0 Identify normal anatomic structure and function of body systems in relation to services performed by a biological Technician, including human/animal/plant cells, cell parts and DNA.

- 16.0 Recognize and demonstrate knowledge of how to utilize and maintain equipment and supplies specific to bio-medical laboratories, including safety measures.
- 17.0 Demonstrate skills and knowledge necessary to perform biological technician duties.
- 18.0 Discuss and follow regulatory guidelines.
- 19.0 Practice quality assurance and safety.
- 20.0 Demonstrate problem solving and decision making skills.

**Florida Department of Education  
STUDENT PERFORMANCE STANDARDS**

**Program Title:** Biomedical Technician  
**Postsecondary Number:** H170206

HEALTH SCIENCE CORE: The Health Science Core is a core of basic knowledge necessary for any health occupations career. Students who have previously completed the Health Career Core in any other health occupations program do not have to repeat intended outcomes 01-11.

- 01.0 DEMONSTRATE KNOWLEDGE OF THE HEALTH CARE DELIVERY SYSTEM AND HEALTH OCCUPATIONS -- The student will be able to:
- 01.01 Identify the basic components of the health care delivery system.
  - 01.02 Describe the various types of health care providers and the range of services available including resources to victims of domestic violence.
  - 01.03 Describe the composition and functions of a health care team.
  - 01.04 Identify the general roles and responsibilities of the individual members of the health care team.
  - 01.05 Develop a basic understanding of human needs throughout the lifespan.
  - 01.06 Explain the importance of maintaining professional competence through continuing education.
  - 01.07 Describe trends affecting the delivery system of health care.
- 02.0 DEMONSTRATE THE ABILITY TO COMMUNICATE AND USE INTERPERSONAL SKILLS EFFECTIVELY -- The student will be able to:
- 02.01 Develop basic listening skills.
  - 02.02 Develop basic observational skills and related documentation strategies in written and oral form.
  - 02.03 Identify characteristics of successful and unsuccessful communication including barriers.
  - 02.04 Respond to verbal and non-verbal cues.
  - 02.05 Compose written communication using correct spelling, grammar, and format.
  - 02.06 Use appropriate medical terminology and abbreviations.
  - 02.07 Recognize the importance of courtesy and respect for patients and other health care workers and maintain good interpersonal relationships.
  - 02.08 Recognize the importance of patient/client education regarding health care.
  - 02.09 Adapt communication skills to varied levels of understanding and cultural orientation.
  - 02.10 Demonstrate telephone usage including taking messages.
  - 02.11 Demonstrate ability to give and follow directions.
  - 02.12 Distinguish between factual reports and personal opinion.
  - 02.13 Read and discuss technical material.
- 03.0 DEMONSTRATE LEGAL AND ETHICAL RESPONSIBILITIES -- The student will be able to:

- 03.01 Discuss the legal framework of the health care occupation.
  - 03.02 Explain the medical liability of health care workers.
  - 03.03 Explain the patients' "Bill of Rights."
  - 03.04 Describe a Code of Ethics consistent with the health care occupation.
  - 03.05 Discuss the importance of maintaining confidentiality of information, including computer information.
  - 03.06 Recognize the limits of authority and responsibility of health care workers.
  - 03.07 Recognize and report illegal and unethical practices of health care workers.
  - 03.08 Recognize and report abuse and neglect.
  - 03.09 Recognize sexual harassment and domestic violence.
- 04.0 DEMONSTRATE AN UNDERSTANDING OF AND APPLY WELLNESS AND DISEASE CONCEPTS -- The student will be able to:
- 04.01 Develop a basic understanding of the structure and function of the body systems.
  - 04.02 Identify personal health practices and environmental factors which affect optimal function of each of the major body systems.
  - 04.03 Identify psychological reactions to illness including defense mechanisms.
  - 04.04 Recognize the steps in the grief process.
  - 04.05 Explain basic concepts of positive self image, wellness and stress.
  - 04.06 Develop a wellness and stress control plan that can be used in personal and professional life.
  - 04.07 Explain the nutrition pyramid.
- 05.0 RECOGNIZE AND PRACTICE SAFETY AND SECURITY PROCEDURES -- The student will be able to:
- 05.01 Demonstrate the safe use of medical equipment.
  - 05.02 Recognize and report safety hazards.
  - 05.03 Identify and practice security procedures for medical supplies and equipment.
  - 05.04 Demonstrate proper body mechanics.
  - 05.05 Demonstrate the procedure for properly identifying patients.
  - 05.06 Demonstrate procedures for the safe transport and transfer of patients.
  - 05.07 Describe fire safety and evacuation procedures.
- 06.0 RECOGNIZE AND RESPOND TO EMERGENCY SITUATIONS -- The student will be able to:
- 06.01 Monitor and record vital signs.
  - 06.02 Describe legal parameters relating to the administration of emergency care.
  - 06.03 Attain and maintain CPR skills.
  - 06.04 Demonstrate basic understanding of first aid and emergency care.
  - 06.05 Recognize adverse drug related emergencies and take appropriate first aid action.

- 07.0 RECOGNIZE AND PRACTICE INFECTION CONTROL PROCEDURES -- The student will be able to:
- 07.01 Demonstrate knowledge of medical asepsis and practice procedures such as handwashing and isolation.
  - 07.02 Demonstrate knowledge of surgical asepsis as utilized in sterilization.
  - 07.03 Describe how to dispose correctly of biohazardous materials, according to appropriate government guidelines such as OSHA.
- 08.0 DEMONSTRATE COMPUTER LITERACY -- The student will be able to:
- 08.01 Define terms and demonstrate basic computer skills.
  - 08.02 Describe the uses of computers in health care.
- 09.0 DEMONSTRATE EMPLOYABILITY SKILLS -- The student will be able to:
- 09.01 Conduct a job search.
  - 09.02 Secure information about a job.
  - 09.03 Identify documents that may be required when applying for a job.
  - 09.04 Complete a job application form correctly.
  - 09.05 Demonstrate competence in job interview techniques.
  - 09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
  - 09.07 Identify acceptable work habits.
  - 09.08 Demonstrate knowledge of how to make job changes appropriately.
  - 09.09 Demonstrate desirable health habits.
  - 09.10 Recognize appropriate affective/professional behavior.
  - 09.11 Write an appropriate resume.
- 10.0 DEMONSTRATE KNOWLEDGE OF BLOOD BORNE DISEASES, INCLUDING AIDS  
-- The student will be able to:
- 10.01 Distinguish between fact and fallacy about the transmission and treatment of diseases caused by blood borne pathogens including Hepatitis B.
  - 10.02 Identify community resources and services available to the individuals with diseases caused by blood borne pathogens.
  - 10.03 Identify "at risk" behaviors which promote the spread of diseases caused by blood borne pathogens and the public education necessary to combat the spread of these diseases.
  - 10.04 Apply infection control techniques designed to prevent the spread of diseases caused by blood borne pathogens to the care of all patients following Centers for Disease Control (CDC) guidelines.
  - 10.05 Demonstrate knowledge of the legal aspects of AIDS, including testing.
- 11.0 APPLY BASIC MATH AND SCIENCE SKILLS -- The student will be able to:
- 11.01 Draw, read, and report on graphs, charts and tables.

- 11.02 Measure time, temperature, distance, capacity, and mass/weight.
- 11.03 Make and use measurements in both traditional and metric units.
- 11.04 Make estimates and approximations and judge the reasonableness of the result.
- 11.05 Convert from regular to 24 hour time.
- 11.06 Demonstrate ability to evaluate and draw conclusions.
- 11.07 Organize and communicate the results obtained by observation and experimentation.
- 11.08 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solution of such questions.
- 11.09 Calculate ratios.

**OCCUPATIONAL COMPLETION POINT - DATA CODE B (12.0 - 20.0)**

SOC 19-4021 (Biological Technician)

After completion of competencies 12.0 - 20.0, the student will have reached OCP B - Biological Technician

- 12.0 **DISCUSS THE HISTORY, CAREER FIELDS AND BENEFITS OF BIOTECHNOLOGY AND BIO-MEDICAL RESEARCH** -- The student will be able to:
  - 12.01 Graph a history timeline with medical advances due to technology advances.
  - 12.02 Discuss the benefits of bio-technology to society.
  - 12.03 Demonstrate knowledge of various career fields related to bio-technology, including but not limited to those in agriculture, law enforcement, environmental, industrial, & bio-medical.
  - 12.04 Demonstrate a knowledge of the scientific method in general and bio-medical research in particular.
  - 12.05 Discuss ethical, legal and social issues raised by biotechnology.
  - 12.06 Discuss medical, agricultural, forensic, & environmental applications of bio-technology.
  
- 13.0 **DESCRIBE BASIC CONCEPTS AND TECHNIQUES NECESSARY TO WORK EFFECTIVELY IN A BIOTECHNOLOGY LABORATORY** --The student will be able to:
  - 13.01 Discuss the nature of science, lab work, and the role of the Biological Technician.
  - 13.02 Describe modern concepts of molecular biology with a laboratory focus on basic methods for preparing and analyzing nucleic acids.
  - 13.03 Describe basic techniques of plant and animal cell cultures.
  - 13.04 Discuss basic microbiology with and emphasis on the role of bacteria, virus, and fungus in human health and disease.

14.00 **DEMONSTRATE ACCEPTED PROFESSIONAL, COMMUNICATION AND INTERPERSONAL SKILLS SPECIFIC TO THE BIO-MEDICAL SETTING.--**  
The student will be able to:

- 14.01 Discuss professional communication skills when interacting with vendors, colleagues, engineers and scientists.
- 14.02 Comprehend technical vocabulary.
- 14.03 Adhere to lab/engineering notebook-keeping procedures.
- 14.04 Follow and analyze protocols and keep accurate records.
- 14.05 Read, interpret and generate technical reports.
- 14.06 Perform web searches.
- 14.07 Read and understand technical literature.
- 14.08 Perform computer operating skills including use of spreadsheets for data manipulation and use of graphs and charts to depict data.

15.00 **IDENTIFY NORMAL ANATOMIC STRUCTURE AND FUNCTION OF BODY SYSTEMS IN RELATION TO SERVICES PERFORMED BY A BIOLOGICAL TECHNICIAN, INCLUDING HUMAN/ANIMAL/PLANT CELLS, CELL PARTS AND DNA.--**The student will be able to:

- 15.01 Describe the cell as the basic unit of life.
- 15.02 Analyze the difference between plant and animal cells.
- 15.03 Describe the different types of cells.
- 15.04 Describe cell structure.
- 15.05 Analyze the functions of various parts of cells.
- 15.06 Explain the Mendel Theory of Genetics.
- 15.07 Discuss the makeup of chromosomes.
- 15.08 Discuss the process of DNA transfer.
- 15.09 Describe the relationship of cellular science and biotechnology.

16.00 **RECOGNIZE AND DEMONSTRATE KNOWLEDGE OF HOW TO UTILIZE AND MAINTAIN EQUIPMENT AND SUPPLIES SPECIFIC TO BIO-MEDICAL LABORATORIES, INCLUDING SAFETY MEASURES.--**The student will be able to:

- 16.01 Practice aseptic technique.
- 16.02 Recognize and describe the use of laboratory equipment including, but not limited to the following: thermocycler, microscope, fluorometer, hoods, centrifuge, polarimeter, Ph meter, chart recorder, stirs, balance, mixers, conductivity meters, autoclaves, shakers, power supplies, dry heat, ovens, incubators, bunsen burners, and Geiger counters.
- 16.03 Check and maintain equipment and logs.
- 16.04 Clean organize and sterilize materials.
- 16.05 Order and maintain inventory of supplies.

16.06 Handle and store biological and hazardous materials.

17.00 **DEMONSTRATE SKILLS AND KNOWLEDGE NECESSARY TO PERFORM BIOLOGICAL TECHNICIAN DUTIES.**-- The student will be able to:

- 17.01 Prepare solutions and reagents for laboratory use.
- 17.02 Monitor physical properties of reagents, buffers, media and solutions.
- 17.03 Set up laboratory tests.
- 17.04 Describe and/or perform basic microbiology skills.
- 17.05 Describe and/or perform basic cell biology skills.
- 17.06 Describe and/or perform basic immunological skills.
- 17.07 Describe and/or perform basic genetic skills.
- 17.08 Describe and/or perform chemical assays.
- 17.09 Sterilize supplies and equipment.
- 17.10 Package sterile products.
- 17.11 Demonstrate an understanding of standard bio-compatibility tests.

18.00 **DISCUSS AND FOLLOW REGULATORY GUIDELINES.** - - the student will be able to:

- 18.01 Discuss FD&C Act.
- 18.02 Discuss and follow OSHA guidelines.
- 18.03 Discuss and follow other national guidelines including, but not limited to: NIH, DOT, EPA, FDA and CDC.
- 18.04 Discuss and follow state and local regulations.

19.00 **PRACTICE QUALITY ASSURANCE AND SAFETY.** - - the student will be able to:

- 19.01 Identify first aid supplies, personnel, and emergency protection areas.
- 19.02 Use appropriate safety procedures and guidelines.
- 19.03 Monitor, use, store and dispose of hazardous materials properly.
- 19.04 Follow Material Safety Data Sheets (MSDS).
- 19.05 Identify safety symbols and signs.
- 19.06 Demonstrate an ability to utilize safety equipment.
- 19.07 Follow universal precautions.
- 19.08 Maintain a clean work area.
- 19.09 Practice aseptic techniques as required.
- 19.10 Discuss quality control in relation to inspection procedures, testing methods, and internal audits.

20.00 DEMONSTRATE PROBLEM SOLVING AND DECISION MAKING  
SKILLS.- - The student will be able to:

- 20.01 Apply decision making techniques in the workplace, utilizing the scientific method.
- 20.02 Apply problem solving techniques in the workplace, utilizing the scientific method.
- 20.03 Solve basic shop problems using elementary math.
- 20.04 Solve single/variable algebraic equations.
- 20.05 Calculate geometric parameters such as area, circumference, perimeter and volume.
- 20.06 Compute angles and lengths using basic trigonometry.
- 20.07 Convert between measurement systems including metric.
- 20.08 Convert decimals and fractions.
- 20.09 Express ratios as percentages.
- 20.10 Interpret tables and graphs.