



Delaware Department of Education  
CTE & STEM Office  
401 Federal Street, Suite 256  
Dover, DE 19901  
Phone: 302.735.4015  
Submit via email to: [CTE.STEM@doe.k12.de.us](mailto:CTE.STEM@doe.k12.de.us)

## DELAWARE CTE PROGRAM OF STUDY APPLICATION

### LOCAL EDUCATION AGENCY INFORMATION

**Local Education Agency (LEA):**

<b>School(s) where the Program of Study will be Located:</b>	<b>Program of Study Start Date:</b>
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<b>LEA CTE Coordinator Name:</b>	<b>Phone:</b>	<b>E-Mail Address:</b>
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<b>Career Cluster Title:</b> Health Sciences	<b>Career Pathway Title:</b> Therapeutic Services	<b>Program of Study Title:</b> Patient Care Assistant
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**CTE Program of Study Course Titles & Sequence:**

1. Certified Nurse Assistant (CNA)
2. Phlebotomy (PHL)
3. Patient Care Technician (PCT)

**CTE Program of Study Request:**

State-model CTE Program of Study  
 Local CTE Program of Study

### ASSURANCES & SIGNATURES

CTE Program of Study approval and funding is contingent upon the following assurances:

1. The LEA will comply with Delaware Administrative Code, 14 DE Admin. 525, Requirements for Career and Technical Education Programs and the Delaware State Plan for the Carl D. Perkins Career and Technical Education Act of 2006;
2. The LEA will submit CTE program data as required by the Delaware Department of Education;
3. All teachers are certified in the appropriate CTE area and participate in program specific professional learning;
4. The LEA will convene and engage a program advisory committee for the purposes of program development, implementation, and continuous improvement;
5. All students have equal access to the program of study as well as early career/early college options;
6. Career and Technical Student Organizations are integral components of the program of study;
7. The LEA will maintain safe facilities and equipment aligned with the program of study goals; and
8. A process for continuous improvement has been established, which includes a model of evaluation and program improvement.

<b>LEA CTE Coordinator Signature:</b>	<b>Date:</b>
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<b>LEA Chief School Officer Signature:</b>	<b>Date:</b>
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### PROGRAM ADVISORY COMMITTEE MEMBER INFORMATION

Complete the list of program advisory committee members. Program of study representatives should include, but are not limited to: CTE and academic teachers, CTE/curriculum district coordinators, school counselors, business and industry representatives, labor representatives, and post-secondary partners. Community stakeholders including parents and students can also be considered. *Attach additional information if applicable.*

Name:	Title:
Affiliation:	
Address:	
Phone:	E-Mail:
Area of Expertise:	
Representing:	
<input type="checkbox"/> Business/Industry <input type="checkbox"/> Secondary Education <input type="checkbox"/> Post-Secondary Education <input type="checkbox"/> Community/Other	
Name: _____ Title: _____	
Affiliation:	
Address:	
Phone:	E-Mail:
Area of Expertise:	
Representing:	
<input type="checkbox"/> Business/Industry <input type="checkbox"/> Secondary Education <input type="checkbox"/> Post-Secondary Education <input type="checkbox"/> Community/Other	
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<p>Representing:</p> <p><input type="checkbox"/> Business/Industry  <input type="checkbox"/> Secondary Education  <input type="checkbox"/> Post-Secondary Education  <input type="checkbox"/> Community/Other</p>	
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Name:	Title:
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Phone:	E-Mail:
Area of Expertise:	
<p>Representing:</p> <p><input type="checkbox"/> Business/Industry  <input type="checkbox"/> Secondary Education  <input type="checkbox"/> Post-Secondary Education  <input type="checkbox"/> Community/Other</p>	

## LABOR MARKET DEMAND

Certify that a labor market needs analysis has been completed for the proposed CTE program of study. Attach the [Labor Market Information \(LMI\) Review](#) document.

Access the [Labor Market Information \(LMI\) Review](#) document.

- The LEA certifies that regional, state, and local labor market data have been reviewed to assure a demand exists for the POS occupations and that the number of POS completers will not significantly exceed this demand. Department of Labor data are available and/or documented. Supporting evidence of supply and demand is submitted with this proposal.
- No data exist for POS due to a unique labor market demand. Supporting evidence of demand is submitted with this proposal. Evidence may include, but is not limited to: real-time labor market information, documentation of national, regional, state, or local labor trends, or letters from employers or workforce agencies documenting projected employment specific to the career pathway.

## ACADEMIC AND TECHNICAL SKILL STANDARDS

List the academic, technical, and workplace skills and knowledge used to develop the program of study.

### **Title and source of academic standards:**

[Common Core State Standards \(CCSS\)](#)

The Common Core State Standards (CCSS) are national standards that set clear college- and career-ready expectations for kindergarten through 12th grade in English language arts/literacy and Mathematics. The standards help to ensure that students graduating from high school are prepared to take credit bearing introductory courses in two- or four-year college programs and enter the workforce. The standards were developed by the nation's governors and education commissioners, through their representative organizations, the National Governors Association Center for Best Practices (NGA) and the Council of Chief State School Officers (CCSSO). Teachers, parents, school administrators, and experts from across the country provided input into the development of the standards. The implementation of the Common Core, including how the standards are taught, the curriculum developed, and the materials used to support teachers as they help students reach the standards, is led entirely at the state and local levels. For more information on CCSS, please visit the link above.

[Next Generation Science Standards \(NGSS\)](#)

The Next Generation Science Standards (NGSS) are national standards for science that lay out the disciplinary core ideas, science and engineering practices, as well as crosscutting concepts that students should master in preparation for college and careers. The standards were developed through a state-led effort that was managed by Achieve. The development of the NGSS involved the National Research Council (NRC), the National Science Teachers Association (NSTA), the American Association for the Advancement of Science (AAAS), and other critical partners such as K-12 teachers, state science and policy staff, higher education faculty, scientists, engineers, cognitive scientists, and business leaders. For more information on the NGSS, please visit the link above.

**Title and source of technical skill standards:**National Consortium for Health Science Education (NCHSE) – National Health Science Standards

The National Health Science Standards provide a clear and consistent understanding of industry and post-secondary expectation for health science teachers and students. These standards are designed to provide essential knowledge common across health professions to prepare and increase the number of students that are college and career ready. The National Consortium for Health Science Education (NCHSE), in partnership with the U.S. Departments of Education and Labor, has established eleven (11) common health science standards and four (4) career pathway standard sets (i.e. Diagnostic, Therapeutic, Environmental, and Health Information) which guide curriculum related materials for healthcare programs. More than 1,000 healthcare employers, college and university faculty, secondary teachers, and professional organization representatives provided input to identify common practices, reviewed the content for each standard, and piloted the results within their agency or organization. For more information on the National Health Science Standards, please visit the link above.

**Title and source of workplace or other skill standards, as applicable:**Common Career Technical Core (CCTC)

The Common Career Technical Core (CCTC) are national standards for Career & Technical Education (CTE) that help to inform the establishment of state standards and/or programs of study. The CCTC were developed by educators, school administrators, representatives from business and industry, faculty from higher education, as well as workforce and labor markets economists. The CCTC include a set of standards for each of the sixteen (16) Career Clusters and the corresponding Career Pathways that help to define what students should know and be able to do after completing instruction in a program of study. A crosswalk of the NCHSE National Health Science Standards and the CCTC standards for the Health Sciences Career Cluster can be accessed through the following link:

[http://www.healthscienceconsortium.org/docs/Foundation\\_Standards\\_Crosswalk.pdf](http://www.healthscienceconsortium.org/docs/Foundation_Standards_Crosswalk.pdf).

Career Ready Practices (CRP)

The Career Ready Practices (CRP) are a component of the CCTC framework and includes twelve (12) statements that address the knowledge, skills, and dispositions that are important to becoming career ready. The CRP describe the career-ready skills that educators should seek to develop in their students. These practices are not exclusive to a Career Pathway, program of study, discipline, or level of education and should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a career pathway. The CRP statements are embedded throughout the NCHSE Health Science Standards to ensure students possess employability and workplace skills for career success. For more information on the CRP, please visit the link above.

**EARLY CAREER AND EARLY COLLEGE OPPORTUNITIES**

Identify CTE program of study early career opportunities, industry-recognized certifications and licenses, options for early college credit, two- and four-year degree and certification program alignment, and the technical skill attainment measures for the program of study. *Attach articulation/dual enrollment agreement(s).*

**Describe early career opportunities (i.e. work-based learning experiences and industry-mentored projects):**

**List industry-recognized certifications and/or licenses, as appropriate (include the partner organization and credential):**

American Heart Association – The American Heart Association's CPR/First Aid program certifies students for adult, child, and infant CPR, the use of an AED on adults, and treatment of a foreign body airway obstructions for adult and infant victims.

**Describe early college credit options (i.e. advanced placement, dual enrollment, transcribed and/or articulated credit, credit by exam, pre-apprenticeship, other) and options for two- and four-year degree and/or certification program alignment (attach articulation/dual enrollment agreement).**

**The partner organization and hours of credit earned should be included, as applicable:**

Students who successfully complete the Patient Care Assistant program of study with a 80% or better will receive articulated credit at Delaware Technical Community College for the following course:

- BIO110 – Essentials of Anatomy and Physiology (3 credits) \*
- MEA150 – Medical Lab Procedures I (3 credits)\*
- HLH 130 – Nurse Assistant Training (6 credits) \*

\*Depending on the program of study chosen at Delaware Technical Community College, credits completed at the secondary level may provide advanced placement or elective credit.

Many of the Allied Health programs offered at DTCC have connected degree programs with colleges and universities including Delaware State University, Immaculata University, Salisbury University, University of Delaware, Wesley College, Widener University, and Wilmington University. Information about connected degree programs is located at: <https://www.dtcc.edu/academics/transfer-options/connected-degrees>.

**List technical skill attainment measures for the program of study (i.e. industry recognized certification or license, advanced placement, dual enrollment, transcribed and/or articulated credit, dual enrollment, credit by exam):**

- Certification/credentialing exam (specify): AHA CPR/First Aid Certification, Prometic Certified Nurse Assistant, ASPT Phlebotomy Technician, NHA Patient Care Technician
- Licensing exam (specify):
- Nationally recognized exam (specify):
- Advanced standing (specify):
- Other (specify):

#### POS OVERVIEW, COURSE DESCRIPTIONS, END-OF-COURSE, AND PROGRAM ASSESSMENTS

Provide a CTE program of study overview that broadly describes the program and student expectations. Identify end-of-program assessment(s) and opportunities for students to participate in early college and early career experiences. List each course title in the CTE program of study. Provide

an overview of each course and define what students should know and be able to demonstrate upon completion of each level. Identify appropriate end-of-course assessment(s).

#### **Program of Study Overview:**

The Patient Care Assistant Pathway Program will prepare high school students for one of the fastest growing professions in the health care industry today, while also preparing them for post-secondary options following graduation. Classroom theory and hands on clinical components include nursing care, phlebotomy, cardiac function, nutrition, therapeutic communication, psychology, respiratory services, rehabilitation services, EKG readings, and empathetic care to the client, family and community. This two-year training program consists of classroom instruction, lab practicum, and supervised activities in clinics, long term care facilities, and other health care agencies.

This multi-skilled Patient Care Assistant Pathway Program will provide students with marketable job skills following completion in areas such as acute care hospitals, sub-acute care facilities, long-term care, outpatient laboratories, cardiac rehabilitation centers, and various other medical providers. The benefits of obtaining Patient Care Assistant Certification include more job opportunities, increased pay scale, and increased access to the program resources in the Allied Health Degree Programs. Students will have the opportunity to meet with degree program specific advisors at several points of their training to ensure a smooth transition from the Patient Care Assistant Pathway Program to one of the Allied Health degree programs upon successful completion of program entry requirements.

- **Certified Nursing Assistant (EYK 603)** offers students the opportunity to safely perform basic nursing skills under the supervision of the licensed nurse in a health care facility. Communication, observation, and documentation skills are incorporated to aid the student in meeting the psychological, physical and environmental needs of the patient. Following successful completion of this course (85 theory/lab and 85 hours of clinical) the student will be qualified to take the Nurse Aid Competency Examination for certification.
- **Phlebotomy (EYK 601)** prepare students in basic phlebotomy skills. Students are trained to perform a variety of blood collection methods using proper techniques and precautions. Classes are taught in lecture, student laboratory and through a 50-hour clinical experience.
- **Patient Care Technician (WYK 600)** covers basic laboratory skills of the profession to include anatomy & physiology, terminology related to performing and reading electrocardiograms (EKGs), legal and ethical issues pertaining to patient care, social and emotional support, nutrition, and basic communication skills. Universal precautions are integrated with all performed procedures. Competency in CNA and Phlebotomy is required.

#### **End-of-Program Assessment(s):**

- Certification/credentialing exam (specify):
- Licensing exam (specify):
- Nationally recognized exam (specify): AHA Hearsaver CPR, Prometric Certified Nursing Assistant, ASPT Certified Phlebotomy Technician, NHA Certified Patient Care Technician
- Other (specify):

<b>Course title:</b>
Certified Nursing Assistant (CNA)
<b>Course description (include prerequisites):</b>
Certified Nursing Assistant course (EYK603) offers students the opportunity to safely perform basic nursing skills under the supervision of the licensed nurse in a health care facility. Communication, observation, and documentation skills are incorporated to aid the student in meeting the psychological, physical and environmental needs of the patient. Following successful completion of this course (85 theory/lab and 85 hours of clinical) the student will be qualified to take the Nurse Aid Competency Examination for certification.
A 10 <sup>th</sup> grade reading level is a prerequisite for this course.
<b>Course knowledge and skills (what students will know and be able to do):</b>
Upon completion of this course students will:
<ol style="list-style-type: none"> <li>1. Collaborate effectively with members of health care team and demonstrate accountability inherent in the nursing assistant role.</li> <li>2. Demonstrate appropriate and effective communication skills with health care professionals as well as demonstrate ability to effectively communicate with residents who are cognitively impaired and/or with mental health disorders.</li> <li>3. Identify the basic physical and emotional needs of the acute and chronically ill and the geriatric patient, apply basic knowledge and skills to provide assertive care to patients/residents in health care facilities, perform nursing assistant skills in a safe and therapeutic manner, demonstrate skills which incorporate principles of restorative care, and provide basic nursing care to the resident when death is imminent.</li> <li>4. Applies principals of infection control including effective and frequent handwashing procedure, and provides a safe, clean environment.</li> <li>5. Perform activities of daily living for the long-term resident by providing safe personal care of the resident that includes bathing perineal care, catheter care, foot care, nail and hair care, dressing and undressing (including residents with and without paralysis or hemiplegia), mouth and denture care, and feeding.</li> <li>6. Demonstrates care of the residents' personal environment, which includes bedmaking and maintenance of personal care items.</li> <li>7. Apply basic nutrition principles relating to preparation and serving of meals.</li> <li>8. Measures and records resident intake and output, weight, pulse, and respirations.</li> </ol>

9. Assist with mobility of the resident by safe transfer of the resident using transfer devices, ambulation with a gait belt and a walker, proper positioning in a chair or bed as well as performs range of motion of the upper and lower extremities.
10. Complete Heartsaver CPR certification through the American Heart Association (AHA).
11. Identify safety risks and demonstrate appropriate safety precautions; identify abuse potentials and appropriate reporting of abuse; identify and apply HIPAA regulations; and identify risks and assist with emergency procedures.
12. Demonstrate skills in electronic charting as well as identify major body systems and demonstrate appropriate use of medical abbreviations when documenting patient care.

**End-of-Course Assessment(s):**

- Teacher designed assessment
- LEA designed assessment
- Certification/credentialing exam (specify): Prometic-Certified Nursing Assistant  
AHA-Heartsaver CPR Certification
- Licensing exam (specify):
- Nationally recognized exam (specify):
- Other (specify):

**Course title:**

Phlebotomy (PHL)

**Course description (include prerequisites):**

The Phlebotomy (EYK 601) course prepares students in basic phlebotomy skills. Students are trained to perform a variety of blood collection methods using proper techniques and precautions. Classes are taught in lecture, student laboratory and through a 50-hour clinical experience.

A 10<sup>th</sup> grade reading level is a prerequisite for this course.

**Course knowledge and skills (what students will know and be able to do):**

Upon completion of this course students will:

1. Communicate and collaborate effectively with instructors, peers, and clinical site employees; demonstrate accountability in the phlebotomist role while applying HIPAA regulations; and demonstrate emotional stability to allow professional interaction with patients under stressful or demanding conditions.
2. Identify common lab tests and normal values; identify procedures in routine and STAT lab testing; and identify and apply HIPAA regulations.

3. Perform phlebotomy procedures in a safe and therapeutic manner; apply standard precautions and blood-born pathogen standard; and apply basic principles of infection control including prevention of spreading or contracting blood borne illnesses.
4. Identify major body systems and major blood vessels and blood vessels used in venipuncture; and identify, locate and draw blood from appropriate blood vessels.
5. Demonstrate appropriate use of medical terminology as well as appropriate use of medical abbreviations.
6. Identify and select proper specimen containers (e.g., blood tubes for specific blood tests) and as demonstrate proper handling of specimens in the pre-analytical phase.
7. Obtain ten (10) successful human venipunctures and five (5) to seven (7) capillary punctures in the lab setting prior to the clinical experience.
8. Obtain fifty (50) successful human venipunctures from the lab and clinical settings which includes accurate identification of patients, accurate vessel selection for venipuncture, accurate and safe venipuncture technique, accurate tube selection for specific blood tests, accurate and safe specimen handling.

**End-of-Course Assessment(s):**

Teacher designed assessment  
 LEA designed assessment  
 Certification/credentialing exam (specify): ASPH Certified Phlebotomy Technician  
 Licensing exam (specify):  
 Nationally recognized exam (specify):  
 Other (specify):

**Course title:**

Patient Care Technician (PCT)

**Course description (include prerequisites):**

Patient Care Technician (WYK 600) covers basic laboratory skills of the profession to include anatomy and physiology, terminology related to performing and reading electrocardiograms (EKGs), legal and ethical issues pertaining to patient care, social and emotional support, nutrition, and basic communication skills. Universal precautions are integrated with all performed procedures. Competency in CNA and Phlebotomy is required.

A 10<sup>th</sup> grade reading level is a prerequisite for this course.

**Course knowledge and skills (what students will know and be able to do):**

By the end of this course students will:

1. Perform patient care technician clinical skills while demonstrating critical thinking skills in performing patient assessment and care; and use analytical and effective communication skills as required in a variety of health care settings.
2. Practice within the standard of care for a patient care technician; apply legal guidelines as required in a variety of health care settings; and write an incident report.
3. Apply microbiology/infection control as required in a variety of health care settings; and demonstrate infection control measures applicable to direct patient care in a variety of health care settings.
4. Demonstrate critical thinking skills in prioritizing patient care which includes: proper identification of the patient, safe and effective patient care, competent basic nursing care procedures (CNA), competent phlebotomy procedures (PHLEB), competent EKG patient preparation and testing; performance of fasting and non-fasting blood glucose via glucometer and capillary puncture procedure; removal of indwelling urinary catheter; urine specimen collection via indwelling catheter; intravenous (IV) catheter removal; accurate vital signs and pulse oximetry measurement; and post-catheter bladder scanning.
5. Assist the nurse with patient care which includes: accurate POCT blood glucose and urine testing and recording, nasal culture and throat culture swab, weight measurement of an ambulatory patient, and care measures for the hospital patient including those with intravenous (IV) catheters, nasogastric (NG) tubes and feeding tubes.
6. Measure vital signs and document measurement in the patient record; and determine previous results or baseline vital signs prior to procedures.
7. Prepare laboratory test results for the nurse; and distinguish between normal and abnormal test within the scope of the patient care technician and under the supervision of the nurse.
8. Explain rationale for performance of a procedure to a patient; perform Point of Care Testing (POCT) within the scope of practice for the patient care technician; and demonstrate quality control techniques related to specimen collection and handling.
9. Prepare a patient for procedures and/or treatment by accurately explaining the rationale for performance of a procedure; use language/verbal skills that enable patients' understanding; demonstrate sensitivity to patient rights and feelings in patient care procedures and in receiving care; and demonstrate awareness of patients' concerns regarding their perceptions related to the procedure being performed.
10. Perform EKG testing, venipuncture, and capillary puncture; and record patient care and patient education accurately in the patient record.

11. Define terminology related to the general organization of the human body; relate basic chemical principles to cell function and homeostasis; outline the basic structure and functions for normal human cells; describe the organization and functions for tissues and membranes; describe the normal structure and functions for each of the body systems; describe the basic principles of human genetics and heredity; and perform and analyze various lab activities related to anatomy and physiology.
12. Define terminology related to the general organization of the human body, which includes the definition of anatomy and physiology as well as cell, tissue, organ, system, and organism.
13. Identify ten (10) major organ systems of a human being; describe the correct anatomical position of the human body; list the body cavities into two major divisions and their subdivisions; list nine regions of the abdominopelvic cavity; list organs located in each four quadrants of the abdominopelvic cavity; list ten directional terms by describing and giving two examples of each term; define the three planes of division of the body; relate basic chemical principles to cell function and homeostasis; define matter, atom, element, molecule, compound, and mixture, and give examples of each; define pH and describe how the numbers on the pH scale relate to acidity and alkalinity; identify the value of electrolytes in maintaining an adequate acid-base and fluid balance in the body' give examples of cations and anions; define energy, calorie, and adenosine triphosphate (ATP); and list three characteristics of organic compounds, compare fats, carbohydrates, and proteins as to chemical constituents and their role.
14. Outline the basic structure and functions for normal human cells, which includes the cell and organelles; diagram a cell and label the: cell membrane, nucleus, ribosomes, endoplasmic reticulum, mitochondria, centrioles, lysosomes, Golgi apparatus, cilia, flagella, and cytoplasm; describe functions of the organelles; give the composition, location, and function of deoxyribonucleic acid (DNA) in the cell; identify the location and functions of ribonucleic acid (RNA) in the cell; define mitosis and briefly describe the steps of mitosis; describe a semipermeable membrane, diffusion, osmosis, and filtration, define active and passive transport methods, and give an example of each; define phagocytosis and pinocytosis; define isotonic, hypotonic, and hypertonic solutions with regard to their effect on red blood cells (RBCs).
15. Describe the organization and functions for tissues and membranes, which includes define cytology and histology, list four (4) major groups of tissues in the body; give their locations, describe their functions, and give two or three examples of each, define exocrine and endocrine glands, list the four types of membranes, and give the locations and functions of each, define fascia, keloids, perichondrium, and osseous tissue, and describe the normal structure and functions for each of the body systems.
16. Describe four functions of the skin, which includes two structures of the skin, and describe their characteristic features, five appendages of the skin, and describe their functions, identify on the

diagram of skin the following structures: epidermis, dermis, subcutaneous layer, pore, sebaceous gland, sudoriferous gland, pressure receptor, hair follicle, and nerve.

17. Define functions of the skeleton, bones, and joints, which include the five functions of the skeletal system, two main groups of bones, and describe each group, define osteoblast, osteocytes, osteoclast, diaphysis, epiphysis, collagen, compact bone, spongy bone, red bone marrow, yellow bone marrow, periosteum, endosteum, resorption, articular, and arthrology, locate and identify the six cranial bones, locate and identify the eight facial bones, locate and identify the five vertebrae columns, and give numbers for each column, locate the following structures of the vertebrae: centrum, foramen, transverse process, spinous process, laminae, and pedicle, locate and identify the eight structures of the upper extremities and the seven structures of the lower extremities, locate and identify the two thorax bones, and describe their characteristics, name and identify the structures of a femur, name and identify the structure of a pelvis, list six major differences between the male and female pelvis, list the eight common landmarks of bones, define foramen magnum, fossae, intervertebrae foramina, obturator foramina, and anterior fontanel, name the three major kinds of joints, define and give examples of each kind of joint, describe the characteristics of synovial joints, and list the six types of synovial joints, define flexion, extension, abduction, adduction, circumduction, rotation, supination, pronation, inversion, and eversion, and demonstrate each movement correctly, list three compositions of the bone, and list three nutrients required for the bone formation, define axis and axial.
18. Define functions of the musculoskeletal system which include the three main structure, two characteristics of skeletal muscles, describe the sliding filament theory of muscle contraction, define oxygen debt, isotonic and isometric contraction, list two structures for attachments of skeletal muscle, and describe each structure, list and describe the three main parts of muscle, list the four functions of muscle, describe seven principles of muscular action, locate and identify the eighteen major muscles, and list two major muscles involved in the act of breathing.
19. Define functions of the nervous system which include terms such as neurology, autonomic nervous system, neuron, receptor, internuncial neuron, effector, myelin sheath, neurolemma, afferent neuron, efferent neuron, nerve fibers, gray matter, white matter, corpus callosum, neuroglia, encephalon, telencephalon, and meninges, list two major subdivisions of the nervous system; diagram two nerve cells, identifying each cell body, nucleus, dendrites, axon, and synapse, describe the direction of the impulses, and describe the action that occurs at the synapse when given two nerve cells, diagram or identify on charts the following structures: cerebral hemisphere, cerebellum, cerebral cortex, thalamus, hypothalamus, brain stem, midbrain, pons, medulla oblongata, and pituitary gland, diagram the human brain, identifying the frontal, parietal, temporal, and occipital areas, and describe the major functions of each of the areas, list the three main divisions of the brain, and give the location, describe the functions of the cerebral cortex, thalamus, hypothalamus, midbrain, pons, medulla oblongata, cerebellum, and basal nuclei (ganglia), identify the eight functional areas of the cerebrum on the diagram, identify the location of cerebrospinal fluid in the four ventricles, and describe how it is

formed and its two functions, describe the structure of the spinal cord, and list three functions of the spinal cord, describe the nature of a reflex arc, name the three meninges and three spaces, and describe the locations, identify the name and functions of the twelve cranial nerves, identify the numbers and locations of the spinal nerves, and list the three anterior branches, and describe briefly the function of the autonomic nerve system.

20. Define functions of the sensory system which includes the six types of sense receptors affected by the external environment, and state where they are located, locate on a chart or diagram and describe the functions of the major structures of the eye: sclera, choroid, retina, cornea, lens, suspensory ligaments, ciliary muscles, anterior cavity, posterior cavity, vitreous body (humor), aqueous humor, blind spot, iris, conjunctiva, lacrimal apparatus, and optic nerve, define rods, cones, accommodation, presbyopia, hyperopia, myopia, astigmatism, cataract, glaucoma, refraction, and enucleation, identify the intrinsic muscles and extrinsic muscles of the eye, identify the boundaries of the external, the middle, and the inner ear, locate on a chart or model and describe the function of the major structure of the ear, including the auricle, external auditory meatus, tympanic membrane, eustachian tube, ossicles, bony labyrinth, vestibule, cochlea, semicircular canals, perilymph, and endolymph, identify the two sensory nerve supplies to the ear, and list the names of the nerves that involve taste and smell.
21. Define functions of the endocrine system and hormones, which include the terms endocrine, exocrine, and hormone, describe the nature of a negative feedback system for release of most of hormones, locate on a chart or diagram the nine major endocrine glands, and describe the chief action of all hormones secreted from each gland, describe briefly the effects of malfunctioning of the endocrine glands, and briefly describe how the endocrine system responds to stress.
22. Define functions of the blood, which includes terms such as hematology, plasma, pH of blood, thrombus, embolus, ischemia, hypoxia, anoxia, necrosis, procoagulant, and anticoagulant, state the average amount of blood found in an average adult, list the three functions of the blood, and describe each function, identify the nine components of plasma, and describe the functions of each, list the three types of formed elements in the blood, describe an erythrocyte and where it is formed, destroyed, and its function, describe a leukocyte and where it is formed, destroyed, and its function, describe the five types of leukocytes, describe a platelet and where it is formed, destroyed, and its function, describe the chain of events that occurs when an artery forms an embolus that blocks it, describe the chain of steps that occurs in the clotting process, identify the four blood groups, and state which is the universal donor and the universal recipient, describe the effect of blood type on transfusion, list the four reasons for blood transfusion, and state the normal values for the following blood tests and a possible cause for an abnormal reading in each case: hemoglobin (Hb), hematocrit (HCT), white blood cell (WBC), and prothrombin time.
23. Define functions of the heart, which includes terms such as cardiology, chordae tendinea, systole, diastole, cardiac cycle, bradycardia, tachycardia, sinus arrhythmia, premature beats,

murmurs, functional murmur, organic murmur, and electrocardiogram (EKG), identify the location of the heart, and list the three layers of the heart, locate and identify the four chambers, the valves, and the vessels leading into and out of the heart and the two partitions, trace the circulation of blood through the heart and lungs; identify at which points the blood is oxygenated, describe blood circulation through the myocardium, and describe the components of the heart's conduction system, diagram the normal EKG, name each wave, and describe the relationship to the activity of the heart.

24. Define functions of the blood vessels and blood circulation, which includes terms such as: arteries, veins, capillaries, pulmonary vessels, systemic circulation, venules, anastomosis, circle of Willis, saphenous vein, cephalic vein, vasoconstriction, vasodilation, and pulse, name the three layers of the blood vessels, compare and contrast the structure of arteries and veins and what controls the rate of flow of blood, name the four sections of the aorta, name the main branches of the aorta, trace the route of circulation of blood throughout the body by identifying the following: Brachiocephalic, left and right subclavian, left and right common carotid, pulmonary veins, coronary arteries, intercostal arteries, thoracic aorta, gastric artery, splenic artery, mesenteric artery, common iliac artery, femoral artery, testicular artery, hepatic artery, renal artery, celiac trunk, popliteal, axillary, brachial, radial, ulnar, jugular veins, superior vena cava, inferior vena cava, and coronary sinus, list two functions of capillaries, describe the function of the hepatic portal system, and list the six factors that may influence the pulse rate.
25. Define functions of the lymphatic system, which includes the three major functions of the lymphatic system, describe how lymphatic capillaries differ from blood capillaries, list the two main lymphatic ducts, and describe the areas drained by each, and list the major structures of the lymphatic system, and give the function of each.
26. Define functions of the respiratory system, which includes terms such as ventilation, external respiration, internal respiration, cellular respiration, and mediastinum, describe the purpose of the respiratory system, diagram the upper respiratory tract and lungs, labeling the parts in both scientific and lay terms, trace the pathway of O<sub>2</sub> and CO<sub>2</sub>, describe the characteristics and functions of the following structures: nasal cavity, pharynx, larynx, trachea, bronchi, bronchiolus, alveolar duct, and alveolus, identify the location of the lungs, and describe the characteristics of the pleural cavity, describe the nature of the respiratory movement, and name the respiratory center, list the name and amount of the respiratory volume measurement of the following terms: tidal volume, inspiratory reserve volume, expiratory reserve volume, vital capacity, total lung capacity, and functional residual capacity, define dyspnea, apnea, eupnea, hyperpnea, hypopnea, tachypnea, and Cheyne-Stokes respiration, and describe the way in which respiration is regulated.
27. Define functions of the digestive system, which includes terms such as gastroenterology, digestion, absorption, peristalsis, peritoneum, villi, omentum, amino acid, fatty acid, monosaccharide, anorexia, anorexia nervosa, and bulimia, list the structures of the true digestive tract and the accessory organs, list the four main functions of the digestive system, list

the three functions of the mouth, list and describe the four types of teeth, compare and contrast deciduous and permanent teeth, diagram a molar, identify the location of the crown, neck, root, enamel, pulp cavity, dentin, cementum, and 5th cranial nerve, describe the function of salivary glands and the location of the three salivary glands in the body, describe the structures and functions of the pharynx and esophagus, diagram the stomach; identify the cardiac orifice, fundus, rugae, greater curvature, lesser curvature, pyloric canal, pyloric sphincter, pyloric orifice, and duodenum, state the three major functions of the stomach; identify five components of gastric juice, and describe their functions, describe the two phases in the production of gastric juice, state three major sections of the small intestine, list the seven functions of the small intestine; identify four components of intestinal juice, and describe their function, diagram the large intestine, identifying the ileocecal valve, appendix, cecum, ascending colon, transverse colon, descending colon, sigmoid colon, rectum, anal canal, and anal sphincter, describe the three functions of the large intestine, describe the structure and location of the liver, list the eight functions of the liver, describe the structure and function of the gallbladder, diagram a duct system for bile and identify the gallbladder, hepatic duct, cystic duct, common bile duct, pancreas, pancreatic duct, sphincter of Oddi, ampulla of Vater, and duodenum, describe the structure and location of the pancreas, describe all the functions of the pancreas, list absorption of foods in the following structures: stomach, small intestines, and large intestine, and list the four hormones that control digestion.

28. Define functions of the urinary system and body fluids, which includes terms such as urology, specific gravity, polyuria, oliguria, anuria, diuresis, pH of urine, volume, hematuria, pyuria, glycosuria, albuminuria, and ketonuria, list the four organs of the excretory system, and describe the waste from each organ, describe the location and structure of the kidney, describe and label the parts of the urinary system and their functions, describe and diagram a nephron and identify the location and functions of the following terms: afferent arterioles, glomerulus, Bowman's capsule, efferent arteriole, proximal convoluted tubule, loop of Henle, distal convoluted tubule, collecting tubule, calyces, and renal pelvis, list the four processes involved in urine formation and describe the functions of each, describe the role of antidiuretic hormone (ADH) in urine formation, list the four functions of the kidney, name two hormones produced by the kidneys, and describe the functions of each, state the normal and maximum bladder capacities, state the length of the female and the male urethra, name three constituents of urine, compare intracellular and extracellular fluids, define electrolytes; list at least five ions, and describe their functions, state the normal pH of the body fluids, and describe the three mechanisms for regulating the pH of body fluids, and describe the interrelationship between the bladder and the autonomic nerve system.
29. Define functions of the reproductive system, which includes terms such as gynecology, asexual, sexual, gametes, spermatozoa, ova, meiosis, gonads, testosterone, hymen, perineum, episiotomy, puberty, menopause, and contraception, diagram or identify on a chart and describe the functions of the following structures: scrotum, testes, seminiferous tubules, interstitial cells, epididymis, vas deferens, seminal vesicle, ejaculatory duct, Cowpers glands, prostate gland, and penis, draw and label a spermatozoan, diagram or identify on a chart and

describe the functions of the following structures: ovaries, fallopian tubes, uterus (noting the cervix, fundus, body, myometrium, and endometrium), vagina, Bartholin glands, ovarian ligaments, broad ligaments, vulva (noting the clitoris, vestibule, urinary meatus, vaginal opening, labium minus, labium majus, and mons pubis), describe the phases of the menstrual cycle and the hormones involved, describe the function of the mammary glands, and list the advantages of breastfeeding, and list at least five methods of contraception currently in use.

**End-of-Course Assessment(s):**

- Teacher designed assessment
- LEA designed assessment
- Certification/credentialing exam (specify): NHA Certified Patient Care Technician
- Licensing exam (specify):
- Nationally recognized exam (specify):
- Other (specify):

**PROGRAM OF STUDY CURRICULUM**

Identify the method of technical and academic curriculum development (adopted, adapted, or developed in accordance with guidance from the program advisory committee).

**POS technical and academic curriculum will be:**

- Adopted (specify source):
- Adapted (specify source):
- Developed locally (describe):
- Other (specify):

**TEACHER CERTIFICATION**

Provide valid teacher certification(s), candidate experience, pre-requisite and requisite licensure or certification requirement(s) for POS teachers.

**POS teacher requirements include:**

- Teacher certification(s) (list):
- Candidate experience (describe):
- Pre-requisite professional licensure or certification requirement(s) (list):
- Requisite professional licensure or certification requirement(s) (list):
- Professional Licensure or Certification Credit Equivalency (list):
- Other (describe): All pathway courses are taught by DTCC faculty. The minimum requirement for all teaching staff at Delaware Technical Community College is a Bachelor's of Science degree with four (4) years relevant experience in the discipline area.

**VALUE-ADDED OPPORTUNITIES**

List extended early career and college credit opportunities available during the student's senior year. Document transition services, cooperative learning experiences, additional dual enrollment, or other.

**Opportunities for extended and accelerated learning include:**

- Cooperative education (describe):
- Structured internship (describe):
- Dual enrollment (list):
- Advanced Placement (list):
- Transition services (describe):

<input type="checkbox"/> Other (describe):
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#### CAREER AND TECHNICAL STUDENT ORGANIZATIONS

Indicate the Career and Technical Student Organization (CTSO) affiliation by checking the appropriate box.

<input type="checkbox"/> BPA	<input type="checkbox"/> FFA
<input type="checkbox"/> DECA	<input checked="" type="checkbox"/> HOSA-Future Health Professionals
<input type="checkbox"/> FCCLA	<input type="checkbox"/> SkillsUSA
<input type="checkbox"/> Educators Rising	<input type="checkbox"/> TSA

#### PROGRAM OF STUDY MATRIX

Complete the program of study matrix to demonstrate the alignment of academic and technical courses, culminating early career and/or early college experiences. Identify appropriate certification and licensure options, opportunities for obtaining early college credit (courses with articulated or dual enrollment credit agreements should be appropriately designated within the matrix), the post-secondary program sequence, and potential career options. *Attach the Program of Study Matrix.*

Access the [Program of Study Matrix](#).

**DEPARTMENT OF EDUCATION PROGRAM OF STUDY APPROVAL**

The following section will be completed by staff from the Delaware Department of Education, CTE & STEM Office and reported to the LEA as part of the CTE program of study approval process.

**Date Delaware CTE Program of Study Application Received:**

<b>Local Education Agency (LEA):</b>  <b>School(s):</b>	<b>Program of Study Start Date:</b>	
<b>LEA CTE Coordinator Name:</b> _____ <b>Phone:</b> _____ <b>E-Mail Address:</b> _____		
<b>Career Cluster &amp; Code:</b>	<b>Career Pathway &amp; Code:</b>	<b>Program of Study Title &amp; Code:</b>
<b>CTE Program of Study Course Titles, Course Codes, and Funding Levels:</b> 1. Course Name/Course Code/Funding Level: 2. Course Name/Course Code/Funding Level: 3. Course Name/Course Code/Funding Level:		
<b>CTE Concentrator/Completer Course Titles:</b> Concentrator Course: Completer Course:		
<b>CTE Program of Study Request:</b> <input type="checkbox"/> State-model CTE Program of Study <input type="checkbox"/> Local CTE Program of Study		
<b>CTE Program of Study Attachments:</b> <input type="checkbox"/> Labor Market Information (LMI) Review; <input type="checkbox"/> Articulation/Dual Enrollment Agreement(s); and <input type="checkbox"/> Program of Study Matrix.		
<b>DDOE CTE &amp; STEM Director Signature:</b>	<b>Date:</b>	
<b>DDOE Chief Academic Officer Signature:</b>	<b>Date:</b>	