

07 Regulation and Maintenance I (Cardiovascular System and Lymphatic System)

Content Area: **Science**
Course(s):
Time Period: **Full Year**
Length: **20 blocks**
Status: **Published**

General Overview, Course Description or Course Philosophy

Anatomy and Physiology is the study of the structure and function of the human body. This course follows a sequential development of the major body systems in an organized and structured curriculum. The course is designed to give the students a selective overview of human anatomical structure and an analysis of human physiological principles. Labs will include slide work, dissection of various animals and studies of the human skeleton. The course will also use computer simulated dissection.

Medical Terminology is embedded in the study of Anatomy & Physiology and teaches words that pertain to body systems, anatomy, physiology, medical processes and procedures and a variety of diseases. It provides specialized language for the health care team, enabling health care workers to communicate in an accurate, articulate and concise manner. This course is designed to give the students a comprehensive knowledge of word construction, definition and use of terms related to all areas of medical science. The course includes but is not limited to terms related to anatomy of the human body, functions of health and disease, and the use of language in diagnosing and treating conditions related to all of the human body systems. This course replaces the earlier study of Latin and Greek for future healthcare professionals, as it focuses words used in the medical fields.

OBJECTIVES, ESSENTIAL QUESTIONS, ENDURING UNDERSTANDINGS

- Living systems, from the organismal to the cellular level, demonstrate the complementary nature of structure and function.
- Many diseases are caused by organisms such as bacteria and viruses and other microbes, whereas others are caused by intrinsic failures of one or more body systems.
- Biotechnology is the use of biological knowledge to solve human problems.

CONTENT AREA STANDARDS

9-12.HS-LS1-1.6.1	Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.
9-12.HS-LS1-1.6.1	students investigate systems by examining the properties of different materials, the structures of different components, and their interconnections to reveal the system's

function and/or solve a problem. They infer the functions and properties of natural and designed objects and systems from their overall structure, the way their components are shaped and used, and the molecular substructures of their various materials.

9-12.HS-LS1-1.LS1.A.1

Systems of specialized cells within organisms help them perform the essential functions of life.

RELATED STANDARDS (Technology, 21st Century Life & Careers, ELA Companion Standards are Required)

CCSS.Math.Content.HSS-ID	Interpreting Categorical and Quantitative Data
CCSS.Math.Content.HSS-ID.B	Summarize, represent, and interpret data on two categorical and quantitative variables
CCSS.Math.Content.HSS-CP	Conditional Probability and the Rules of Probability
SCI.HS-ETS1-1	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
SCI.HS-ETS1-2	Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
CAEP.9.2.12.C.1	Review career goals and determine steps necessary for attainment.
CCSS.ELA-Literacy.RST.11-12.1	Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.
VHEL.9-12.9.4.12.H.(2).2	Demonstrate knowledge of how to explain procedures and goals to patients/clients accurately and effectively, using a range of response strategies to address patient/client questions and concerns.
VHEL.9-12.9.4.12.H.(5).2	Apply biochemistry, cell biology, genetics, mathematics, microbiology, molecular biology, organic chemistry, and statistics concepts to conduct effective biotechnology research and development.
VHEL.9-12.9.4.12.H.16	Employ critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams to solve problems and make decisions.

STUDENT LEARNING TARGETS

Declarative Knowledge

Students will understand that:

- Diseases and injuries to the cardiovascular system affect the health of an organism.
- These disorders can be detected and treated with technology, but this can create ethical issues.
- The structure and function of the Lymphatic system.
- The Lymphatic system has a significant role in disease prevention.
- Failure of the lymphatic system to function properly due to injury or microbes can impact human health and survival.
- The immune system can cause transplant rejections and be harnessed to fight disease.

- Each system of the body has a specific set of medical terminology that is required.

Procedural Knowledge

Students will be able to:

- - Demonstrate the principles of body mechanics for positioning, transferring and transporting of patients/clients, and perform them without injury to the patient/client or self.
 - Utilize communication strategies to answer patient/client questions and concerns on planned procedures and goals
 - Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.
 - Construct an explanation based on evidence how a systems of specialized cells within organisms help them perform the essential functions of life.
 - Read and comprehend science/technical texts in the grades 11-CCR text complexity band independently and proficiently.
 - Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.
 - Read and comprehend science/technical texts in the grades 11-CCR text complexity band independently and proficiently.
 - Cite specific textual evidence to support analysis of science and technical texts
 - Communicate information within a healthcare classroom and demonstrate how to convey this information to appropriate departments and professionals in a timely manner to facilitate sharing of key diagnostic information used in treating patients.
 - Apply the quantitative and qualitative terminology and codes for a range of medical information and analyze the information for designated purposes in order to facilitate the flow of information among individuals in a healthcare environment.
 - Interpret verbal and nonverbal cues/behaviors to enhance communication.
 - Apply active listening skills to obtain and clarify information.
 - Develop and interpret tables, charts, and figures to support written and oral communications.
 - Apply biochemistry, cell biology, genetics, mathematics, microbiology, molecular biology, organic chemistry, and statistics concepts to conduct effective biotechnology research and development.
 - Employ critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams to solve problems and make decisions.
 - demonstrate an understanding of the roles and responsibilities of all members of the healthcare team, including their ability to promote the delivery of quality healthcare.
 - Apply ethical reasoning to a variety of situations in order to make ethical decisions.
 - Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
 - Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.
 - Summarize, represent, and interpret data on a single count or measurement variable

- Fit a function to the data; use functions fitted to data to solve problems in the context of the data.
- Use technology to access, manage, integrate, and disseminate information.
- Use effective oral and written communication strategies for creating, expressing, and interpreting information and ideas that incorporate technical terminology and information.

EVIDENCE OF LEARNING

Formative Assessments

- Informal checks for understanding
- Exit tickets
- Do now
- Homework (Chapter Outcome Outlines)
- Study guide questions.
- Video Overviews with guided notes
- Discuss terminology words and pronunciation.
- Give practice in both pronunciation and understanding the words.
- Provide students with handouts for in-class collaborative work
- Crossword Puzzles, Word Searches and case studies pertinent to the unit and have students analyze and define medical terms.
- StudyWare Games and Quizzes as time permits
- Current events in Healthcare: Discussion Circle

Summative Assessments

- Laboratory histology activity on cardiac tissue and pathological conditions of the heart and vessels
- Heart Dissection lab
- Blood typing and transfusion lab
- POGIL-Cardiac Output
- Lab Activity on exercise and SV and CO
- Quiz on the cardiovascular system and blood
- Case Study analysis
- Chapter test on the Cardiovascular System
- Benchmarks – departmental benchmark given at the end of MP1 and MP3 based on lab practices

- Alternative Assessments
 - Lab inquiries and investigations
 - Lab Practicals
 - Exploratory activities based on phenomenon
 - Gallery walks of student work
 - Creative Extension Projects
 - Build a model of a proposed solution
 - Let students design their own flashcards to test each other
 - Keynote presentations made by students on a topic
 - Portfolio

RESOURCES (Instructional, Supplemental, Intervention Materials)

YouTube Crash Course Video Links for Unit 5:

The Heart, part 1 - Under Pressure: Crash Course A&P #25

<https://youtu.be/X9ZZ6tcxArl>

The Heart, part 2 - Heart Throbs: Crash Course A&P #26

<https://youtu.be/FLBMwcvOaEo>

Blood, Part 1 - True Blood: Crash Course A&P #29

<https://youtu.be/HQWlcSp9Sls>

Blood, Part 2 - There Will Be Blood: Crash Course A&P #30

<https://youtu.be/9-XoM2144tk>

Blood Vessels, part 1 - Form and Function: Crash Course A&P #27

<https://youtu.be/v43ej5lCeBo>

Blood Vessels, part 2: Crash Course A&P #28

<https://youtu.be/ZVklPwGALpI>

Sheep's Heart &

Dissection Equipment

Instructions and demo links

https://youtu.be/960_mAShiXQ

<https://youtu.be/Vr-DAhgq75w>

Classroom Manipulatives:

The Heart

INTERDISCIPLINARY CONNECTIONS

- Integrate quantitative or technical information expressed in words in a text. Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.
- Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.
- Experimentation
- Social Emotional Learning
- Enginereering

ACCOMMODATIONS & MODIFICATIONS FOR SUBGROUPS

See link to Accommodations & Modifications document in course folder.