

# 04 Integration and Control systems I (Central Nervous System and Senses)

Content Area: **Science**  
Course(s):  
Time Period: **Full Year**  
Length: **18 blocks**  
Status: **Published**

## **General Overview, Course Description or Course Philosophy**

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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**

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- 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**

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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-LS1-2.LS1.A.1	Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level.

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

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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.
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.
VHEL.9-12.9.4.12.H.44	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.
VHEL.9-12.9.4.12.H.45	Apply ethical reasoning to a variety of situations in order to make ethical decisions.

## **STUDENT LEARNING TARGETS**

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### **Declarative Knowledge**

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Students will understand that:

- The structure of the nervous system is designed to respond to various internal and external stimuli.
- The central nervous system is the control and processing unit of the body.
- The central nervous system regulates the endocrine system.
- Diseases and injuries of the nervous system can seriously impair normal cell functions and the health of the organism
- The body has both general and special senses.
- Special senses are located in specific regions of the body and their cells preform a specific response
- Each system of the body has a specific set of medical terminology that is required.
- Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level.
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### **Procedural Knowledge**

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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.
- Demonstrate language arts knowledge and skills required to pursue the full range of postsecondary education and career opportunities.
- Demonstrate mathematics knowledge and skills required to pursue the full range of postsecondary education and career opportunities.
- Identify transferable career skills and design alternate career plans.
- Evaluate and use information resources to accomplish specific occupational tasks.
- 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.
- Apply biochemistry, cell biology, genetics, mathematics, microbiology, molecular biology, organic chemistry, and statistics concepts to conduct effective biotechnology research and development.
- 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.
- 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.
- Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
- Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.
- 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.
- Identify a full range of career and postsecondary education opportunities within the career cluster.
- 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**

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### **Formative Assessments**

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- Informal checks for understanding
- Exit tickets
- Do now
- Homework (Chapter Outcome Outlines)
- Study guide questions.
- Video Overviews
- 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**

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- Laboratory activity stations examining the histology of the Nervous System and various tissue types
- Laboratory activity on the structure of a neuron and neuroglial cells and the physiology of the action potential and release of neurotransmitters across the synapse
- Laboratory dissection of the brain
- Laboratory activity on the the neural pathway and sensory, integration, and motor activity

- Senses Activity Vision, Hearing, Taste, and Smell
  - Laboratory dissection of the cow eye
  - Quizzes on the NS & Senses
  - Chapter test on the Nervous System & Senses
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- 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)**

Erhlich Instructor's Manual Resources:

Crossword Puzzles, Word Searches and case studies

Chapter Quizzes, Tests

Cengage StudyWare CD-ROM :

Chapter 12 games and quizzes

POGIL: Anatomy and Physiology Workbook

Kaplan Anatomy and Physiology Coloring Book

Biozone Anatomy and Physiology Workbook

Crash Course by Hank

## **INTERDISCIPLINARY CONNECTIONS**

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- 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
- Engineering

## **ACCOMMODATIONS & MODIFICATIONS FOR SUBGROUPS**

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See link to Accommodations & Modifications document in course folder.