Perris Union High School District
Course of Study

A. COURSE INFORMATION

Course Title:
RCOE Anatomy & Physiology for the Health Profession

- ✓ New
- ☐ Revised

If revised previous course name if changed

Transcript Course Code/Number:

(To be assigned by Educational Services)

Subject Area:
- ☐ Social Science
- ☐ English
- ☐ Mathematics
- ✓ Laboratory Science
- ☐ World Languages
- ☐ Visual or Performing Arts
- ☐ College Prep Elective
- ☐ Other

Is this classified as a Career Technical Education course?
- ✓ Yes
- ☐ No

Grade Level
- ☐ MS
- ✓ HS
- ☐ 5
- ☐ 6
- ☐ 7
- ☐ 8
- ✓ 9
- ✓ 10
- ✓ 11
- ✓ 12

Required for Graduation:
- ☐ Yes
- ✓ No

Meets UC/CSU Requirements?
- ✓ Yes
- ☐ No

Was this course *previously approved by UC* for PUHSD?
- ☐ Yes
- ✓ No

(Will be verified by Ed Services)

Credential Required to teach this course:
Designated Subjects; Career Technical Education; Health Science + Medical Technology

To be completed by Human Resources only.

Signature 11/29/2021 Date

CalPADS CODE 7921 Per RCOE

Meets "Honors" Requirements?
- ☐ Yes
- ✓ No

Meets "AP" Requirements?
- ☐ Yes
- ✓ No

Submitted by: Dian Martin
Site: Educational Services
Date: 11/19/2021

Unit Value/Length of Course:
- ☐ 0.5 (half year or semester equivalent)
- ✓ 1.0 (one year equivalent)
- ☐ 2.0 (two year equivalent)
- ☐ Other:

Approvals	Name/Signature	Date
Director of Curriculum & Instruction		11/29/21
Asst. Superintendent of Educational Services		11/29/21
Governing Board		

RCOE ANATOMY & PHYSIOLOGY FOR THE HEALTH PROFESSION

DATE:

INDUSTRY SECTOR: Health Science and Medical Technology Sector

PATHWAY: Patient Care

CALPADS TITLE: Intermediate Patient Care (Concentrator)

CALPADS CODE: 7921

HOURS:

Total	Classroom	Laboratory/CC/CVE
180	127	53

JOB TITLE	O*NET CODE	JOB TITLE	O*NET CODE
Health Educators	21-1091.00	Family and General Practitioners	29-1062.00
Medical Records and Health Information Technicians	29-2071.00	Community Health Workers	21-1094.00

COURSE DESCRIPTION:

This is a rigorous course designed around the framework of the health profession in general. It provides a solid foundation for understanding the human body's structure and systems, and how these systems interact to maintain homeostasis as a result of illness and disease (e.g., diabetes, dehydration, or hypoglycemia). The clinical material and class labs are designed to bridge the concepts presented in the lecture to real-life applications and scenarios.

A-G APPROVAL: D

ARTICULATION:

College	Course Code
Norco College	BIO-45: Survey of Human Anatomy and Physiology

DUAL ENROLLMENT: None

PREREQUISITES:

Prerequisite
Algebra I (Required)
Biology (Recommended)

METHODS OF INSTRUCTION

- Direct instruction
- Group and individual applied projects
- Multimedia
- Demonstration
- Field trips
- Guest speakers

STUDENT EVALUATION:

- Student projects
- Written work
- Exams
- Observation record of student performance
- Completion of assignment

INDUSTRY CERTIFICATION:

- No

RECOMMENDED TEXTS:

- Essentials of Human Anatomy and Physiology Elaine N. Marieb, Suzanne M. Keller McGraw Hill 12th/2018 https://www.pearson.com/us/higher-education/program/Marieb-Essentials-of-Human-Anatomy-Physiology-P

PROGRAM OF STUDY:

- None identified

I.	UNIT I: HUMAN BODY ORIENTATION: LEVELS OF ORGANIZATION, BASIC CHEMISTRY, AND CELLS	CR	Lab/ CC	Standards
	Description: This unit will introduce students to the course with an overview of anatomy and physiology. Students will identify the levels of structural organization, the elements necessary to sustain life, proper anatomical terminology relevant to directional terms and body planes, and the function and relevance of homeostasis. Next students will develop an understanding of matter and energy, molecules and compounds, chemical bonds and chemical reactions, and the biochemistry of living matter. Finally, this unit will have students consider the basic structures of cells and how cells perform the necessary activities for life. **Key Assignments**: 1. Students will interact and participate in a class discussion on the language of anatomy. The instructor will explain and demonstrate multiple examples of the class. The class will then get into groups to discuss the anatomical position, directional terms, and body planes/cavities. Next, students will develop a written response explaining various examples of proper use of anatomical language, then demonstrate their examples to the class. 2. Students will work in small groups to build a generalized cell model. Each cell model will include all of the anatomical structures common to many human cells. Every anatomical structure identified in the model must be labeled. The function of each structure must be identified and described in a typed document that will supplement the cell model. **Lab:** Applications of the pH scale to acidic and basic solutions, and to buffers. **Major Focus Question**: How is chemistry applicable to the study of anatomy and physiology of the human body? **Lab Overview**: Students interpret pH paper readings, describe and apply the pH scale, describe the purpose and effects of a buffer, and describe the differences in solubility of ionic, polar and non-polar covalent molecules in different solvents. Students make predictions and then take pH measurements of several solutions to determine where they fall on the pH scale. Students predict and then examine the effects of adding an acid or a base to buffered solutions and non-buffered solutions.	17	7	**Academic:** LS: 11-12.1 **CTE Anchor:** Communications: 2.1 **CTE Pathway:** B1.1

II.	UNIT II: TISSUES AND, SKIN AND BODY MEMBRANES	CR	Lab/ CC	Standards
	Description: The skin is an organ and is a part of the integumentary system. Students will investigate the different types of human tissues that build up organs, then analyze the relationship between tissue structure and function. In addition, students will identify and investigate different types of skin diseases and disorders including the diagnosis, signs and symptoms, treatments, and prevention measure for each. **Key Assignments**: 1. Students will be able to calculate the percentage of burns on a patient, in multiple scenarios, using the "Rule of Nine" Burn Chart. Students will work in groups to analyze their findings, then report their findings to the class. 2. Students will create a 3D skin model using a tissue box. Students will incorporate each layer of the Integumentary System (epidermis, dermis, and hypodermis) by building the different cell layers and accessory structures of each layer. In addition, students will research a skin disease and incorporate their findings on their model. (Disease name, the onset of disease, signs, and symptoms, populations affected, treatment options, etc). **Lab:** Practical Patient Care Lab Activities **Major Focus Question**: How do healthcare professionals properly protect themselves from infection when treating injuries to the tissues? **Lab Overview**: In a medical practical lab setting, students demonstrate appropriate infection control, personal protective equipment, proper hand washing techniques, and prevention of cross-contamination. Students are shown the various types of wounds (e.g. punctures, abrasions, and lacerations) and how a healthcare provider would treat them based on the severity of the wound. Students review and identify the various types of wounds, using their textbook and Internet resources; label an anatomical chart with specific types of wounds and explain, in written summaries for each wound, the location of the wound, using anatomical terms, the extent of the wound, and how they would treat each wound. Written summaries also include identifying locations of the body region that are affected (e.g. superior, inferior, anterior, posterior, etc.), types of tissue involved. (e.g. epithelial tissue or connective tissue).	20	4	**Academic:** LS: 11-12.1 **CTE Anchor:** Communications: 2.1 **CTE Pathway:** B1.1

III.	UNIT III: THE SKELETAL SYSTEM	CR	Lab/ CC	Standards

	Description: This unit focuses on the investigation of how the elements of the skeletal system provide support and movement of the human body. Students will evaluate the bones, connective tissues, and articulations of the skeletal system. Students will research injuries and diseases of the skeletal system (e.g. types of skeletal fractures) including the diagnosis, signs and symptoms, treatments and prevention measures for each. **Key Assignment**: 1. Students will assemble a disarticulated skeleton. Students classify bones according to their shape, identify the parts of the long bone, identify all bones of the skull, identify the bones and markings of the axial and appendicular skeleton by building a skeleton using disarticulated bones. **Lab:** Assembling a Disarticulated Skeleton (Students will spend several class periods on this lab.) **Main Focus Question**: How does the structure of bone and articulation of bones allow for the functions of movement, protection, blood cell formation, storage of inorganic salts, and form passageways for blood vessels and nerves? **Lab Overview**: Students classify bones according to their shape, identify the parts of the long bone, identify all bones of the skull, classify joints based on structure and function, and identify the bones and markings of the axial and appendicular skeletons by building a skeleton using disarticulated bones. Students identify structures associated with synovial joints and their range of motion. Students examine the differences between the fetal skull and an adult skull.	6	4	**Academic:** LS: 11-12.1 **CTE Anchor:** Communications: 2.1 **CTE Pathway:** B1.1
IV.	**UNIT IV: MUSCULAR SYSTEM**	**CR**	**Lab/ CC**	**Standards**
	Description: Students will identify the structures and functions of the muscular system and its relation with other body systems. Students will evaluate the parts and activity of skeletal muscle including the muscle movements, roles, and names. Students will evaluate the developmental aspects of the muscular system (e.g. the effects of age on muscle mass and strength). **Key Assignment**: 1. Students will identify the observable structural differences between skeletal, smooth, and cardiac muscle. To distinguish between smooth, skeletal, and cardiac muscle tissue, students will examine diagrams or prepared slides of muscle tissue. After sketching and labeling key features, students are given several unmarked diagrams or slides. Students must then determine the correct muscle tissue type based on their description and observations made from the original slides which were based on the structural differences between the three main types of muscle tissue. **Lab:** Participation in a muscular fatigue lab **Main Focus Question**: How does physical activity affect the body's muscles abilities to perform work? As muscles fatigue, which type of muscle fatigue is experienced (psychological vs muscular)? How does psychological fatigue differ from muscular fatigue? What is the body experiencing during each? **Lab Overview**: Students will identify the types of muscular fatigue: physiological fatigue versus muscular fatigue. Next, students will work in pairs to complete a muscle fatigue lab by participating in a variety of physical activities (jumping jacks, calf raises, etc) in an attempt to create and experience muscular fatigue. Students will identify the signs and symptoms of fatigue they experienced, analyze their collected data, then record their findings regarding when their muscles began to fatigue, how they know this, and conclude what type(s) of fatigue they experienced.	10	4	**Academic:** LS: 11-12.1 **CTE Anchor:** Communications: 2.1 **CTE Pathway:** B1.1
V.	**UNIT V: NERVOUS SYSTEM & THE SPECIAL SENSES**	**CR**	**Lab/ CC**	**Standards**
	Description: This unit will demonstrate how the nervous system is involved, in some way, in nearly every body function. In this unit, students will identify and explain the functions and divisions of the nervous system. Students will explore how the nervous system maintains communication between the external and internal environment of the body as well as homeostatic imbalances that may affect the nervous system. In this unit, students will also identify the organization and function of the sensory organs and describe how their communication and interaction maintain homeostasis and enable the body to respond to changing conditions. Students will investigate diseases and disorders of the sensory organs (e.g. Students will evaluate the developmental aspects of congenital disorders of the sensory organs). **Key Assignment**: 1. Students will work in pairs to perform clinical reflex tests on the patellar, triceps, and plantar reflexes in which the students will observe reflex reactions when a reflex hammer is applied to the appropriate tendon/ligament. Students will write a report explaining their findings for each reflex test. Including the tendon that was assessed, the patient's response, and the validity of the examiner's findings. **Lab:** Participation in a muscular fatigue lab **Main Focus Question**: How is one's taste sense affected when other senses, such as sight and smell, are	16	8	**Academic:** LS: 11-12.1 **CTE Anchor:** Communications: 2.1 **CTE Pathway:** B1.1

	restricted? **Lab Overview**: Students will complete a lab on taste in which students will have their visual, then both visual and olfactory senses, taken away. Students will attempt to properly determine the flavors they are tasting. Finally, students will identify the dependent and independent variables in this lab and explain the relationship between taste and the other special senses; including how adding or eliminating special senses affect one's ability to interpret taste.			
VI.	**UNIT VI: ENDOCRINE SYSTEM**	**CR**	**Lab/ CC**	**Standards**
	Description: The body's ability to maintain homeostasis is based upon the precise regulation of the body's organs and organ systems. Students in this unit will learn how the endocrine systems work to regulate and maintain the body's homeostasis. Students will identify the major endocrine organs, the hormones they produce, and the developmental aspects of those structures. (an e.g. Decreasing function of ovaries during menopause). **Key Assignment**: 1. Students will write a research paper (3-4 pages) on a disease that is unique to the endocrine system. Diseases could include hyperthyroidism, diabetes mellitus type I, diabetes mellitus type II, etc. The research paper should include the function of the endocrine system, major glands, related hormones, and description of the disease. Students should also discuss signs & symptoms, populations affected, appropriate treatment options, etc. Statistics will also be included in the research paper. **Lab:** Endocrine System Anatomy – Urinalysis **Main Focus Question**: Where are the Endocrine Glands located in the body, what hormones are produced by these ductless glands, and what are the effects on their target tissues? **Lab Overview**: a Urinalysis is an important tool in diagnosing diseases and disorders. In a laboratory investigation, students will test urine for color, specific gravity, pH, and the presence or absence of glucose, protein, and /or ketone to identify and analyze these specific physical and chemical properties of urine specific to diabetes. The students will collect and record the data in appropriate tables. Students will present their findings, evidence, and evidence-based predictions to the following questions: How would the specific gravity of urine be different after a vigorous workout without consuming significant quantities of water? The presence of ketones is often high in the urine of both diabetics and people who suffer from anorexia. What characteristics would these two groups have in common? What factors would contribute to a very high or very low pH in urine?	6	3	**Academic:** LS: 11-12.1 **CTE Anchor:** Communications: 2.1 **CTE Pathway:** B1.1
VII.	**UNIT VII: BLOOD & CARDIOVASCULAR SYSTEM**	**CR**	**Lab/ CC**	**Standards**
	Description: In this unit, students will identify the factors that make blood vital to the survival of the human body. Students will learn about the functions of blood, including its composition and its form elements. Students will describe homeostasis, identify blood groups, and the developmental aspects of blood (e.g. congenital blood defects). Students will also learn about the anatomy, functions of the cardiovascular system and its relationship with other body systems. Students will explain the structure and function of the body's blood vessels, distinguish between systemic, pulmonary, and cardiac circulation, and identify all structures in the human heart and the major arteries and veins. Students will explain the process of the cardiac cycle, the pathway of blood, and the relationship among the contraction of each of the chambers. **Key Assignment**: 1. Students investigate the structural differences between arteries, veins, and capillaries. Students will examine slides or photographs of each blood vessel type. Students will then use provided illustrations to identify the characteristics unique to each blood vessel type by labeling and coloring them on the provided illustrations. **Lab:** Student will work in small groups to build a heart model out of clay. **Major Focus Question**: What are the major structures of the heart, and what is the function of each? **Lab Overview**: Students will work in small groups to build a heart model out of clay. Students will include all of the anatomical structures (valves, chambers, vessels, etc.) associated with the human heart. Students will label each structure and create a model key that identifies the structures represented in their model and explains the function of each structure. Finally, students will present their model to the class and discuss specific structures and functions represented in their model.	19	5	**Academic:** LS: 11-12.1 **CTE Anchor:** Communications: 2.1 **CTE Pathway:** B1.1
VIII.	**UNIT VIII: LYMPHATIC SYSTEM**	**CR**	**Lab/ CC**	**Standards**

	Description: Students will learn how the lymphatic system and the components of other systems continually provide protection for the body. Students will identify the various types of white blood cells that respond to infection in the body. In addition, lymphatic vessels transport excess fluid from the interstitial spaces in most tissues and return it to the bloodstream. **Key Assignment**: 1. Students will identify the major lymph vessels, lymph nodes, spleen, thymus, and tonsils of the body on a provided diagram by labeling each structure. Students will then research a disease that affects this system (diagnosis, signs and symptoms, treatments, preventive measures, etc.). **Lab:** Model Inventory of the Lymphatic System **Major Focus Question**: Where are lymph organs and lymph vessels located in the body? **Lab Overview**: Using models and interactive companion websites, students identify major Lymph vessels, Lymph Nodes, Spleen, Thymus and Tonsils of the body.	6	3	**Academic:** LS: 11-12.1 **CTE Anchor:** Communications: 2.1 **CTE Pathway:** B1.1
IX.	**UNIT IX: RESPIRATORY SYSTEM**	**CR**	**Lab/ CC**	**Standards**
	Description: Students identify the organs and anatomical features of the respiratory system using diagrams and class models. Working with models, students illustrate and explain the function of the respiratory system, the pathway of air, and distinguish between pulmonary ventilation, external respiration, internal respiration, and cellular respiration. Students will research respiratory diseases and disorders including developmental aspects (e.g. sids). **Key Assignment**: 1. In a 1200 word essay, students will compare and contrast the respiratory systems of an infant, child, adult, elder, athlete, and smoker. **Lab:** Build the major structures of this body system then combine them to create the entire system **Major Focus Question**: Which anatomical structures combine to form the respiratory system? How do oxygen and carbon dioxide function in this system? **Lab Overview**: Students will create a candy respiration model by creating individual pieces for each major structure, then connect all of the candy organs to form the entire respiratory system. Students will label each organ then develop a written response that analyzes the way oxygen and carbon dioxide function in this system during respiration.	9	5	**Academic:** LS: 11-12.1 **CTE Anchor:** Communications: 2.1 **CTE Pathway:** B1.1
X.	**UNIT X: DIGESTIVE SYSTEM**	**CR**	**Lab/ CC**	**Standards**
	Description: Students will describe the structure and function of the digestive organs and accessory glands. Using diagrams, models and teacher instruction, students identify and analyze chemical and mechanical digestion of food in every section of the alimentary canal, focusing on the interaction of the two processes. Included in this section will be peristalsis; contrasting the mechanical and chemical elements of digestion in the stomach including the components of gastric juice; chemical digestion and absorption in the small intestine; the function of bile, digestive enzymes, and accessory digestive organs; the absorption of water in the large intestine; and the formation and elimination of solid waste. **Key Assignment**: 1. Students will work in pairs to trace the pathway of food from the oral cavity to the anus. To demonstrate this, students will create a poster that displays and explains all structures of the digestive system and the process that food goes through within each structure. **Lab:** Gross anatomy of the digestive system **Major Focus Question**: What are the major structures of this body system? **Lab Overview**: Through interactive companion websites, and models, students identify the major anatomical structures of the respiratory system.	6	3	**Academic:** LS: 11-12.1 **CTE Anchor:** Communications: 2.1 **CTE Pathway:** B1.1
XI.	**UNIT XI: URINARY SYSTEM**	**CR**	**Lab/ CC**	**Standards**
	Description: Students identify the kidney and other urinary tract structures, anatomical features and functions of the excretory system, using models and diagrams. Students identify all components of the nephron and explain the physiological processes and structures involved in urine formation, filtration, reabsorption, and secretion. Students illustrate common conditions resulting from kidney malfunction or failure. **Key Assignment**: 1. Students will write a 500-word report on acute renal failure including signs, symptoms, and treatment	6	3	**Academic:** LS: 11-12.1 **CTE Anchor:** Communications: 2.1 **CTE Pathway:** B1.1

	and preventative measures. **Lab:** Create an experiment that will demonstrate osmosis **Major Focus Question**: What does the movement of water tell us about osmotic pressure? **Lab Overview**: Students will conduct an experiment to see how osmosis works. Place a few cherries in a bowl of water and then put a lid on the bowl. Take the lid off the bowl the next day and examine the cherries. How have the cherries changed? How do you explain these changes?			
XII.	**UNIT XII: REPRODUCTIVE SYSTEM**	**CR**	**Lab/ CC**	**Standards**
	Description: Students learn to identify the organs and accessory organs of the male and female reproductive system, the hormones related to male and female development and reproduction, and sperm and egg formation. Students understand the sequence of events in pregnancy and the stages of development from fertilization to birth, as well as the effects of aging on the reproductive systems of males and females. **Key Assignment**: 1. Students will work in pairs to create a powerpoint that will trace a developing zygote from fertilization to implantation to birth. **Lab:** Meiotic cell division **Major Focus Question**: Will meiotic cell division create a gamete with half the chromosomes of other cells? Using random assignment of chromosomes, gametes are created which create how many different combinations of chromosomes? **Lab Overview**: Students will start with 46 chromosomes (23 from the mother and 23 from the father). Students will use 23 pennies (chromosomes from the mother), 23 nickels (chromosomes from the father), 1 quarter, 2 sets of coin-sized labels numbered 1-23. The student will place the pennies in a row across the desk, evenly spaced. Place a nickel next to each penny. Place a numbered label beside each penny-nickel pair. For example, the first penny and nickel should be labeled "1," the next penny and nickel should be labeled "2," and so forth, through the 23 pairs. Flip the quarter. If it lands heads up, place the penny from the first penny-nickel pair into the bowl. If it lands tails up, place the nickel from the first penny-nickel pair into the bowl. Continue flipping the quarter for each penny-nickel pair until you have 23 coins in the bowl. Record the numbers of the pennies and nickels in the bowl. Repeat 5 times. How many times did you get the exact same combination of coins? How many combinations may occur if you repeated this forever? Record your findings then compare with classmates.	6	4	**Academic:** LS: 11-12.1 **CTE Anchor:** Communications: 2.1 **CTE Pathway:** B1.1
XIII.	**RCOE COLLEGE AND CAREER TRANSITION PLAN (CCTP)**	**CR**	**Lab/ CC**	**Standards**
	This unit of instruction links student interests to potential careers through exploration and research. Students will develop a post-secondary career plan that identifies and maps out a course of action which incorporates college and career opportunities. Within the twelve (12) topics, students will complete interest surveys, career related documents (i.e., applications, resumes, letters of introduction, letters of recommendation), and mock interviews with the express goal of preparing students to graduate from high school academically and socially prepared for college, the workforce, and civic responsibility. Additionally, students will analyze the importance of financial literacy through topics such as credit, creating a budget, and saving and investing. **Lessons**: • Work, Job, and Career • The Career Plan • Job Applications (Portfolios – Part 1) • The Letter of Introduction (Portfolios – Part 2) • Resume (Portfolios – Part 3) • Letters of Recommendation (Portfolios – Part 4) • Interviewing • Career Research and Reflection • Financial Literacy (Part 1 – The Basics) • Financial Literacy (Part 2 – Credit) • Financial Literacy (Part 3 – Creating a Budget) • Financial Literacy (Part 4 – Saving and Investing) **Key Assignments**: 1. **RCOE College and Career Transition Guide**: This project will incorporate the development of a 5-10 year career plan, preparing a portfolio (letter of introduction, resume, and letters of recommendation), and practicing job applications and mock interviews. 2. **Financial Literacy**: This project will include identifying elements and deduction on a paycheck, research	15	0	**Academic:** LS: 11-12.1 **CTE Anchor:** Communications: 2.3, 2.4 Career Planning and Management: 3.1, 3.2, 3.4, 3.8, 3.9 Technology: 4.1 Problem Solving and Critical Thinking: 5.4 Responsibility and Flexibility: 7.6 **CTE Pathway:** B1.1

	loan options based on credit worthiness, creating a budget, and planning for retirement.			
XIV.	COURSE NOTES	CR	Lab/ CC	Standards
	6/4/2021: CCTP Unit added – Course not in Pathway Book 1.3	0	0	**Academic:** LS: 11-12.1 **CTE Anchor:** Communications: 2.1 **CTE Pathway:** B1.1

Entered by:

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