HUMAN BODY SYSTEMS  
Course Syllabus

Course Number: SCMA-0001  
OHLAP Credit: No  
OCAS Code: 8707  
Course Length: 120 Hours  
Career Cluster: Science, Technology, Engineering & Mathematics  
Career Pathway: Science & Mathematics  
Career Major(s): PLTW Biomedical Science and Medicine

Pre-requisite(s): None

Course Description: The human body is a complex system requiring care and maintenance. This course will engage students in the study of basic human physiology, especially in relationship to human health. Students will use a variety of monitors to examine body systems (respiratory, circulatory, and nervous) at rest and under stress, and observe the interactions between the various body systems. Students will use LabView software to design and build systems to monitor body functions.

Textbooks: Project Lead the Way curriculum.

Course Units:

Unit One - Identity

Lesson 1: Identity: Human
  Activity 1.1.1 - Amazing Facts
  Activity 1.1.2 - Orientation to the Maniken® (Directional/Regional Terms)

Lesson 2: Identity: Tissues
  Activity 1.2.1 - Identity of Your Maniken® (Histology Review/Build Face)
  Activity 1.2.2 - Skeleton Scavenger Hunt
  Project 1.2.3 - Bone Detectives: Forensic Anthropology
  Activity 1.2.4 - Height Estimation from Bones

Lesson 3: Identity: Molecules and Cells
  Activity 1.3.1 - DNA Detectives
  Activity 1.3.2 - Careers in Identity
  Project 1.3.3 - Biometrics: Who Are You?

Unit Two – Communication

Lesson 1: The Brain
  Activity 2.1.1 - The Power of Communication
  Activity 2.1.2 - Build-A-Brain
  Project 2.1.3 - Map-A-Brain

Lesson 2: Electrical Communication
  Activity 2.2.1 - The Neuron
Activity 2.2.2 - The Secret to Signals
Project 2.2.3 - Reaction Time (LabVIEW)
Activity 2.2.4 - It's All in the Reflexes (LabVIEW)
Activity 2.2.5 - Communication Breakdown

Lesson 3: Chemical Communication
Activity 2.3.1 - The Hormone Connection
Project 2.3.2 - Hormones Gone Wild

Lesson 4: Communication with the Outside World
Activity 2.4.1 - Exploring the Anatomy of the Eye
Activity 2.4.2 - Visual Perception
Project 2.4.3 - Put Yourself in Someone Else’s Eyes
Activity 2.4.4 - Eye Care Professionals

Unit Three - Power
Lesson 1: Introduction to Power
Activity 3.1.1 - Resources for Life
Activity 3.1.2 - The Rule of Threes

Lesson 2: Food
Project 3.2.1 – Digestive System Design
Project 3.2.2 – Living in a Material World (Optional – alternative for Project 3.2.1)
Project 3.2.3 - The Amylase Experiment
Activity 3.2.4 - Metabolism- A Balancing Act
Activity 3.2.5 - In Search of Energy

Lesson 3: Oxygen
Activity 3.3.1 - How Does Oxygen Get to Your Cells?
Activity 3.3.2 - Measuring Lung Capacity (LabVIEW)
Activity 3.3.3 - Oxygen Capture by the Lungs (LabVIEW)
Activity 3.3.4 - Respiratory Therapy Resume

Lesson 4: Water
Activity 3.4.1 - Hook up the Plumbing
Activity 3.4.2 - Spotlight on the Kidney
Project 3.4.3 - The Blood/Urine Connection
Activity 3.4.4 - Water Balance
Activity 3.4.5 - Urinalysis

Unit Four - Movement
Lesson 1: Joints and Motion
Activity 4.1.1 - Bones, Joints, Action!
Activity 4.1.2 - Range of Motion

Lesson 2: Muscles
Activity 4.2.1 - Muscle Rules
Activity 4.2.2 - Building a Better Body - Muscles of the Deep Chest
Project 4.2.3 - Maniken® Mystery Muscles
Activity 4.2.4 - Laws of Contraction
Project 4.2.5 - Rigor Mortis Modeling
Activity 4.2.6 - You’ve Got Nerve
Lesson 3: Blood Flow
  Activity 4.3.1 - The Heart of the Matter
  Project 4.3.2 - Varicose Veins
  Activity 4.3.3 - Go With the Flow
  Activity 4.3.4 - Cardiac Output
  Activity 4.3.5 - Smoking Can Cost You an Arm and a Leg!

Lesson 4: Energy and Motion: Exercise Physiology
  Project 4.4.1 - The Body's Response to Exercise
  Activity 4.4.2 - Mind Over Muscle (LabVIEW)
  Activity 4.4.3 - Performance Enhancers
  Problem 4.4.4 - Training A Champion

Unit Five – Protection
Lesson 1: The Skin
  Activity 5.1.1 - Under My Skin
  Activity 5.1.2 - Burn Unit
  Activity 5.1.3 - Hurts So Good: Pain as Protection

Lesson 2: Bones
  Activity 5.2.1 - Looking Inside Bone
  Activity 5.2.2 - X-ray Vision
  Activity 5.2.3 - Bone Remodeling and Repair

Lesson 3: Lymph and Blood Cells
  Activity 5.3.1 - To Drain and Protect
  Activity 5.3.2 - Transfusion Confusion
  Activity 5.3.3 - Fighting the Common Cold
  Project 5.3.4 - Lines of Defense

Unit Six – Homeostasis
Lesson 1: Health and Wellness
  Problem 6.1.1 - Surviving the Extremes
  Activity 6.1.2 – Putting it All Together
  Problem 6.1.3 – Building a Case
  Activity 6.1.4 - Finishing Touches

All PLTW Objectives

Teaching Methods: The class will primarily be taught by student-led research activities and projects along with the demonstration method and supported by various media materials to address various learning styles. There will be question and answer sessions over material covered in lecture and media presentations. Supervised lab time is provided for students to complete required projects.
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Grading Procedures:
1. Students are graded on theory and lab practice and performance.
2. Each course must be passed with seventy (70%) percent or better. Grading scale: A=90-100%, B=80-89%, C=70-79%, D=60-69%, F=50-59%.

Description of Classroom, Laboratories, and Equipment: Tulsa Technology Center campuses are owned and operated by Tulsa Technology Center School District No. 18. All programs provide students the opportunity to work with professionally certified instructors in modern, well-equipped facilities.

Available Certifications/College Credit: There are no certification exams for this program, for it is a college-prepatory program. College credit can be earned by successfully completing an AP level course and passing the AP exam with a score of 3 or higher. See program counselor for additional information.

College Credit Eligibility: The student must maintain a grade point average of 2.0 or better. The following career major(s) may require a 3.0 GPA or better due to the Articulation Agreements and/or accreditation/certification requirements: Certified Dental Assistant, Emergency Medical Technician (EMT), Licensed Practical Nurse (LPN), Surgical First Assistant (SFA), Surgical Technologist, Surgical Nurse Assistant, Central Sterile Processing Technician.