

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

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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

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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-preparatory 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.