Secondary Course Outline
Forest Lake Area Schools

Course name:

College in the Schools - Human Physiology, Technology, and Medical Devices
University of Minnesota - Biol 1015

Grade(s): **12th**

Course description (as found in the registration guide):

This life-science course is organized around the core principles of human physiology, such as homeostasis, information flow, causal mechanisms, structure and function relationships, and the levels of organization. Students first learn the concept of hierarchical organization of the body and the basic mechanism for homeostasis, which provides a foundation for all subsequent course topics related to health (e.g.,cardiovascular fitness) and disease (e.g., atherosclerosis and Type 2 diabetes). In every class period, students will learn about technologies and/or medical devices associated with the science. For example, during units on the cardiovascular system students will engage in assignments focusing on pacemakers and stents, and how these technologies have affected both medical culture and the health of our wider society.

Graduation standard(s) information: (alignment with Minnesota Academic Standards or national standards)

0.5 Science Elective credit

Not a direct MN State Science Standard but associated with the following:

9-12 **4. Life Science**

1. Structure and Function of Living Systems
    1. Organisms use the interaction of cellular processes as well as tissues and organ systems to maintain homeostasis.
        9.4.1.1.1
        Explain how cell processes are influenced by internal and external factors, such as pH and temperature, and how cells and organisms respond to changes in their environment to maintain homeostasis.
        9.4.1.1.2
        Describe how the functions of individual organ systems are integrated to maintain homeostasis in an organism.

Learner outcomes:

- Define anatomy, and explain the importance of understanding the relationship between structure and function.
- Describe four important types of organic molecules and their functions in the human body.
- Explain how the structures of a cell contribute to its function.
- List the structure & functions of the major body systems: skeletal, muscular, nervous, integumentary, endocrine, circulatory, respiratory, excretory, reproductive & digestive.
- Describe the digestion, absorption, and transport of carbohydrates, lipids, and proteins.
- Describe diagnostic blood test and the normal values for the tests, and give examples of disorders that produce abnormal test values.
- Describe the flow of blood through the heart, and name each of the chambers and structures through which the blood passes.
- Describe the relationships among chemical signals, receptor molecules, and receptor sites.
- List the major categories of hormones on the basis of their chemical structure.

Course content: (Write this in outline format.)

Quarter 1 - Introduction to Physiology

Unit 1--Introduction to Anatomy and Physiology

Unit 2--CHEMISTRY

Unit 3 and 4--CELLS and TISSUES

QUARTER 2 - Musculo-skeletal, Digestive

Unit 4--SKELETAL

Unit 5--MUSCULAR

Unit 6--DIGESTIVE

QUARTER 3 - Cardiovascular

Unit 7--BLOOD

Unit 8--HEART

Unit 9--VESSELS

Quarter 4 - Nervous, Endocrine, Reproductive

Unit 10--NERVOUS

Unit 11--ENDOCRINE SYSTEM

Unit 12--REPRODUCTIVE

Required Curriculum Materials: (This section should contain information regarding textbooks, technology integration, films, videos and various resources used in teaching the course. Please note whether items already exist in-district or will need to be purchased. Any additional notes that are useful to teachers should be included.)

Need to be purchased

- ***Visual Essentials of Anatomy & Physiology*, Martini, F., Ober, W., Bartholomew, E., Nath, J. (2012), Benjamin Cummings**
- ***The Digital Doctor*, by Dr. Robert Wachter.**
- **POGIL Activities for Introductory Anatomy and Physiology Courses**
- **Vernier Probeware & Sensors (EKG & Heart Rate Monitors)**