SPRING GROVE AREA SCHOOL DISTRICT

PLANNED COURSE OVERVIEW

Course Title: Human Anatomy and Physiology	**Length of Course:** 30 cycles
Grade Level(s): 12	**Periods Per Cycle:** 6
Units of Credit: 1	**Length of Period:** 43 minutes
Classification: Elective	**Total Instructional Time:** 129 hours

Course Description

This advanced level course will examine human anatomy and physiology, and it is designed for students wishing to pursue a medical career. This course will study the following (but not limited to) body systems: Integumentary, Skeletal, Muscular, Nervous and Special Senses, Digestive, Blood and Cardiovascular. This course will also examine basic biochemistry and cellular processes which are essential to understanding human physiology. Human anatomy and physiology will offer a variety of laboratory experiences, which will include specimen dissections.

Instructional Strategies, Learning Practices, Activities, and Experiences

Teacher Demonstration
Detailed Laboratory Experiments
Inquiry Laboratory Experiments
Textbook Reading
Homework
Posted Objectives and Agenda
Formal Assessments
Guided Practice
Online Tutorials/Resources
Critical Thinking
Bell Ringers
Class Discussion
Flexible Groups

Assessments

Chapter Examinations
Laboratory Write-ups/Reports
Mid Term and Final Exam
Unit Projects
Directed Reading Packets
Study Guides

Materials/Resources

Essentials of Human Anatomy and Physiology, 8th Ed. (Pearson)
PowerPoint Lectures
Note Packets
Online Resources
Laboratory Resources and Equipment
Laboratory Experiments

Adopted: 5/19/14
Revised:

Basic Scientific Principles and The Chemistry of Life	
CONTENT/KEY CONCEPTS	**OBJECTIVES/STANDARDS**
A. The Scientific Method B. Inorganic Chemistry C. Molecular Diversity of Life D. Feedback Recognition E. Structure and Function of Macromolecules F. Free Energy	**3.1.12.A1:** Relate changes in the environment to various organisms' ability to compensate using homeostatic mechanisms. **3.1.12.A2:** Evaluate how organisms must derive energy from their environment or their food in order to survive. **3.1.12.A7:** Evaluate metabolic activities using experimental knowledge of enzymes. Describe the potential impact of stem cell research on the biochemistry and physiology of life. **3.1.12.A8:** Describe and interpret dynamic changes in stable systems. **3.1.12.A9:** Compare and contrast scientific theories. Know that both direct and indirect observations are used by scientists to study the natural world and universe. Identify questions and concepts that guide scientific investigations. Formulate and revise explanations and models using logic and evidence. Recognize and analyze alternative explanations and models. Explain the importance of accuracy and precision in making valid measurements. Examine the status of existing theories. Judge that conclusions are consistent and logical with experimental conditions. **CC.3.5.11-12.G.** 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. **CC.3.5.11-12.H.** 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. **CC.3.5.11-12.B.** Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. **CC.3.5.11-12.C.** Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

Basic Scientific Principles and The Chemistry of Life, continued	
CONTENT/KEY CONCEPTS	**OBJECTIVES/STANDARDS**
	CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 11–12 texts and topics*. **CC.3.6.11-12.B.** Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. **CC.3.6.11-12.C.** Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. **CC.3.6.11-12.E.** Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. **CC.3.6.11-12.F.** Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

Cells	
CONTENT/KEY CONCEPTS	**OBJECTIVES/STANDARDS**
A. Animal Cell Structure B. Cell Membranes and Transport C. Cell Division D. Basic Cellular Genetics	**3.1.12.A4:** Explain how the cell cycle is regulated. **3.1.12.A5:** Analyze how structure is related to function at all levels of biological organization from molecules to organisms**.** **3.1.12.A9:** Compare and contrast scientific theories. Know that both direct and indirect observations are used by scientists to study the natural world and universe. Identify questions and concepts that guide scientific investigations. Formulate and revise explanations and models using logic and evidence. Recognize and analyze alternative explanations and models. Examine the status of existing theories. Evaluate experimental information for relevance and adherence to science processes. Judge that conclusions are consistent and logical with experimental conditions. **3.1.10.B1:** Describe how genetic information is inherited and expressed. **3.1.10.B2:** Explain the process of meiosis resulting in the formation of gametes. Compare and contrast the function of mitosis and meiosis. **3.1.10.B3:** Describe the basic structure of DNA and its function in genetic inheritance. Describe the role of DNA in protein synthesis as it relates to gene expression. **3.1.12.B1:** Explain gene inheritance and expression at the molecular level. **3.1.12.B3:** Analyze gene expression at the molecular level. **CC.3.5.11-12.G.** 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. **CC.3.5.11-12.H.** 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.

Cells, continued	
CONTENT/KEY CONCEPTS	**OBJECTIVES/STANDARDS**
	CC.3.5.11-12.B. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. **CC.3.5.11-12.C.** Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text. **CC.3.5.11-12.D.** Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 11–12 texts and topics*. **CC.3.6.11-12.B.** Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. **CC.3.6.11-12.C.** Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. **CC.3.6.11-12.E.** Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. **CC.3.6.11-12.F.** Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

The Language of Human Anatomy	
CONTENT/KEY CONCEPTS	**OBJECTIVES/STANDARDS**
A. Language of Anatomy • Body Terminology • Tissues of the Body • Organ System Overview	**3.1.12.A5:** Analyze how structure is related to function at all levels of biological organization from molecules to organisms. **3.1.12.A6:** Analyze how cells in different tissues/organs are specialized to perform specific functions. **CC.3.5.11-12.G.** 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. **CC.3.5.11-12.H.** 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. **CC.3.5.11-12.B.** Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. **CC.3.5.11-12.C.** Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text. **CC.3.5.11-12.D.** Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 11–12 texts and topics*. **CC.3.6.11-12.B.** Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. **CC.3.6.11-12.C.** Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. **CC.3.6.11-12.E.** Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. **CC.3.6.11-12.F.** Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

Human Body Systems	
CONTENT/KEY CONCEPTS	**OBJECTIVES/STANDARDS**
A. Integumentary System B. Skeletal System C. Muscular System D. Nervous System E. The Five Senses F. Blood G. Circulatory System H. Lymphatic System I. Digestive System J. Endocrine System	**3.1.12.A5:** Analyze how structure is related to function at all levels of biological organization from molecules to organisms. **3.1.12.A6:** Analyze how cells in different tissues/organs are specialized to perform specific functions. **CC.3.5.11-12.G.** 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. **CC.3.5.11-12.H.** 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. **CC.3.5.11-12.B.** Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. **CC.3.5.11-12.C.** Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text. **CC.3.5.11-12.D.** Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 11–12 texts and topics*. **CC.3.6.11-12.B.** Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. **CC.3.6.11-12.C.** Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. **CC.3.6.11-12.E.** Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. **CC.3.6.11-12.F.** Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.