Elizabethtown Area School District

Human Anatomy and Physiology

Course Number:	357	Length of Course:	1 semester – 18 weeks
Grade Level:	10-12 Elective	Total Clock Hours:	120 hours
Length of Period:	80 minutes	Date Written:	June 11, 2007
Periods/Week :	5 periods/week	Written By:	Chris Eurich
Credits (if app.):	1.0	Weighting:	1.1
Prerequisite:	Biology		

Course Description:

This course is a study of the structure and function of the human body. Major units include: levels of organization, support and movement, integration and coordination, transport, absorption and excretion and the human life cycle. Numerous lab activities will supplement the classroom experience including a dissection of a fetal pig and other selected organs.

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I. Overall Course/Grade Level Standards

Students will KNOW and be able TO DO the following as a result of taking this course.

A. The relationship between structure and function in the human body.

B. The hierarchal levels of organization within the human body.

C. The specific terminology associated with the anatomy of the human body.

D. The relative location of the various organ systems, organs and tissues of the human body.

E. The function(s) of the various organ systems and the associated organs.

F. The chemical basis of the processes associated with the human body.

G. The physiology of the life processes.

H. The feedback systems in the human body that maintain a constant, ideal, internal condition.

I. The cause and nature of disease associated with the human body.

J. Demonstrate safe and proper lab techniques.

K Follow procedural directions to perform dissections of selected specimens.

L. Use the internet for research and drill & practice on topics relating to human anatomy and physiology.

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II. Content

Major Areas of Study

Unit	Estimated Time	Materials
1. Levels of Organization	1 week	Textbook, Prepared Overheads, Model of Human Torso, Computer/Internet
2. Cell Structure/Function and Tissues	2 weeks	Textbook, Prepared Overheads, Prepared Microscope Slides, Microscopes, Computers/Internet
3. Body Covering Integumentary System	1 week	Textbook, Prepared Overheads, Computer/Internet
4. Support and Movement Skeletal System Muscular System	3 weeks	Textbook, Prepared Overheads, Prepared Microscope Slides, Microscopes, Models of Human Skeleton, Skull, Hand, Foot, Vertebrae, Computer/Internet
5. Integration and Coordination Nervous System Special Senses Endocrine System	3 weeks	Textbook, Prepared Overheads, Audiometer, Preserved Brains & Eyes, Models of Eye & Ear, Computer/Internet
6. Transport Blood Circulatory System Lymphatic System	3 weeks	Textbook, Prepared Overheads, Preserved Hearts, Simulated Blood, Microscopes, Model of Heart, Computer/Internet
7. Absorption and Excretion Digestive System Respiratory System Urinary System	3 weeks	Textbook, Prepared Overheads, Preserved Kidneys, Prepared Microscope Slides, Microsocpes, Models of Digestive System, Lung, & Kidney, Computer/Internet
8. Human Life Cycle Reproductive System	1 week	Textbook, Prepared Overheads, Models of ♂/♀ Reproductive Systems, Computer/Internet
9. Fetal Pig Dissection	1 week	Lab Manual, Prepared Overheads, Preserved Fetal Pigs, Video on Fetal Pig Dissection, Computer/Internet

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Name of Course: Human Anatomy and Physiology
Name of Unit : 1- Levels of Organization
Essential Question: What is the language of anatomy used to describe the human body?

Unit Objectives/Key Questions	Priority	Aligned to Course Standard	Aligned to PA Standard
A1. Define anatomy and physiology, and explain how they are related.	E	A	3.3.12.A
B1. List and describe the major characteristics of life and the major requirements of organisms.	E	F, G	3.3.12.B
C1. Define homeostasis, explain its importance to survival, and describe a homeostatic mechanism.	E	H	3.1.12.E 3.3.12.B
D1. Explain biological levels of organization.	E	B	3.1.12.C 3.3.12.A
E1. Describe the locations of the major body cavities and list the major organs located in each.	E	D	3.3.12.A
F1. Name and identify the membranes associated with the thoracic and abdominopelvic cavities.	E	C, D	3.3.12.A
G1. Name the major organ systems, list the organs associated with each, and describe their general functions.	E	C, D, E	3.3.12.A, B
H1. Properly use the anatomical terms that describe relative positions, body sections, and body regions.	E	L	3.3.12.A

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Name of Course: Human Anatomy and Physiology
Name of Unit : 2- Cell Structure/Function and Tissues
Essential Question: What is the structure and function of cells and how do they interact with other cells to form tissues?

Unit Objectives/Key Questions	Priority	Aligned to Course Standard	Aligned to PA Standard
A3. Explain how cells differ from each other.	E	A	3.3.12.A, B 3.7.10.A, B
B3. Describe the functions of various types of organic chemicals in cells.	E	F	3.3.12.B
C3. Describe each type of organelle, and explain its function.	E	A, B, G	3.3.12.A, B 3.7.10.A, B
D3. Explain how the structure of a cell membrane makes possible its functions.	E	A	3.3.12.A, B
E3. Explain how substances move through cell membranes.	E	A, G	3.3.12.B
F3. List the events that occur in the cell cycle when a cell divides.	I	A, G	3.3.12.C 3.7.10.A, B
G3. Discuss what happens when a cell specializes or differentiates.	I	A,G	3.3.12.C
H3. List the four major tissue types, and provide examples of where each occurs in the body.	E	A, C, D	3.3.12.A 3.7.10.A, B
I3. Explain how glands are classified.	C	A, C	3.3.12.A

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Curriculum Form

Name of Course: Human Anatomy and Physiology
Name of Unit : 3- Body Covering
Essential Question: How does the integumentary system control the interaction between the internal and external environments of the body?

Unit Objectives/Key Questions	Priority	Aligned to Course Standard	Aligned to PA Standard
A4. Describe the four major types of membranes found in humans.	E	A, D	3.3.12.A
B4. Describe the structure of the various layers of the skin and list their general functions.	E	A, E	3.3.12.B
C4. Describe the accessory organs associated with the skin.	I	A, E	3.3.12.A
D4. Explain how the skin functions in regulating body temperature.	I	A, E, G	3.3.12.A, B
E4. List the events that are part of wound healing.	C	E, G	3.3.12.A 3.3.12.B
F4. List some common skin disorders and describe their characteristics.	C	I	3.3.12.A, B

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Name of Course: Human Anatomy and Physiology
Name of Unit : 4- Support and Movement
Essential Question: How do the skeletal and muscular systems allow the human body to move?

Unit Objectives/Key Questions			
A5. Describe the general structure of a bone and list the functions of its parts.	E	A, C, E	3.3.12.A
B5. Discuss the major functions of bones.	E	E	3.3.12.A, B
C5. Distinguish between the axial and appendicular skeletons and name the major parts of each.	E	C, D	3.3.12.A
D5. Locate and identify the bones, and the major features of the bones, that comprise the skull, vertebral column, thoracic cage, pectoral girdle, upper limb, pelvic girdle, and lower limb.	E	A, C, D	3.3.12.A
E5. List the classes of joints, describe their characteristics, and name an example of each.	E	A, C, D	3.3.12.A
F6. Explain how skeletal muscles produce movements at joints, and identify several types of joint movements.	E	A, E, G	3.3.12.A, B
G6. Name the major parts of a skeletal muscle fiber and describe the function of each part.	E	A, E	3.3.12.A, B
H6. Explain the major events that occur during muscle fiber contraction and how it obtains energy for this purpose.	E	G	3.3.12.B
I6. Explain how various types of muscular contractions are used to produce body movements and maintain posture.	E	H	3.3.12.A
J6. Identify and describe the location of the major skeletal muscles of each body region and describe the action of each muscle.	E	C, D, E	3.3.12.A

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Name of Course: Human Anatomy and Physiology
Name of Unit : 5- Integration and Coordination
Essential Question: How do the nervous and endocrine systems coordinate and integrate the functions of other body systems so that the internal environment remains able to function normally?

Unit Objectives/Key Questions			
A7. Explain the general functions of the nervous system.	E	E	3.3.12.A
B7. Describe the general structure of a neuron and how it allows information to be transmitted to other neurons.	E	A	3.3.12.A, B
C7. Describe the events which lead to the conduction of a nerve impulse.	E	G	3.3.12.B
D7. Name the major parts and functions of the brain, spinal cord and peripheral nervous system.	E	C, D, E	3.3.12.A
E7. Describe the functions of the autonomic nervous sytesm and distinguish between the sympathetic and parasympathetic divisions.	E	C, E	3.3.12.A, B
F8. Identify the parts and functions of the organs of sensation including the ear, eye, tongue, nose and skin.	E	D, E, G	3.1.12.A 3.3.12.A, B 3.7.10.A, B
G9. Explain how the nervous and endocrine systems are alike and how they are different.	E	A, G	3.3.10.A
H9. Define the term hormone and list its function.	E	F, G	3.3.12.A
I9. Name and describe the location of the major endocrine glands of the body, and list the hormones they secrete and their functions.	E	D, E	3.3.12.A
J9. Discuss how hormonal secretion is regulated by negative feedback systems and the nervous system.	E	H	3.1.12.E 3.3.12.B

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Name of Course: Human Anatomy and Physiology
Name of Unit : 6- Transport
Essential Question: How does the body transport needed materials to cells and remove waste products from cells?

Unit Objectives/Key Questions			
A10. Describe the general characteristics of blood, and discuss its major functions.	E	E	3.2.12.C 3.3.12.A, B, C 3.7.10.A, B
B10. List the steps involved in blood clotting.	E	G, H	3.3.12.B
C11. Name the organs of the cardiovascular system, and discuss their functions.	E	D, E	3.3.12.A
D11. Trace the pathway of the blood through the heart and the major vessels of the body.	E	D, E	3.3.12.A
E11. Identify the parts of a normal ECG pattern and discuss the significance of this pattern.	E	G	3.1.12.C 3.3.12.B
F11. Explain how blood pressure is created, controlled and measured using a sphygmomanometer.	E	G, H	3.3.12.B 3.7.10.A, B
G11. Compare the pulmonary and systemic circuits of the cardiovascular system.	E	E, G	3.3.12.A
H11. Identify and locate the major arteries and veins of the pulmonary and systemic circuits.	E	C, D	3.3.12.A
I12. Describe the general functions of the lymphatic system.	E	E	3.3.12.A 3.3.12.B
J12. Identify the organs of the lymphatic system and discuss their functions.	E	C, D	3.3.12.A

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Name of Course: Human Anatomy and Physiology
Name of Unit : 7- Absorption and Excretion
Essential Question: How does the body process raw materials so they can be absorbed and utilized by cells and also remove their waste products to maintain an optimum internal environment?

Unit Objectives/Key Questions			
A14. Describe the general functions of the digestive system.	E	E	3.3.12.A
B14. Name the major organs of the digestive system and state their functions.	E	C, D, E	3.3.12.A, B
C14. List the enzymes that the digestive organs and glands secrete, and describe the function of each.	E	G	3.3.12.B
D14. Explain how the products of digestion are absorbed.	E	A, G	3.3.12.B
E14. Describe an adequate diet.	E	F, G	3.3.12.B
F13. List the general functions of the respiratory system.	E	E	3.3.12.A
G13. Name the major organs of the respiratory system and state their functions.	E	C, D, E	3.3.12.A 3.3.12.B
H13. Discuss the factors that influence the rate of respiration.	E	G, H	3.1.12.E 3.3.12.B
I15. Name and list the general functions of the organs of the urinary system.	E	D, E	3.3.12.A
J15. Describe a nephron, and explain the functions of its major parts.	E	A, C, E, G	3.3.12.A, B

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Curriculum Form

Name of Course: Human Anatomy and Physiology
Name of Unit : 8- Human Life Cycle
Essential Question: How do the male and female reproductive systems assure survival of the species?

Unit Objectives/Key Questions			
A16. State the general functions of the male and female reproductive systems.	E	E	3.3.12.A
B16. Name the parts of the male and female reproductive systems, and describe the general functions of each part.	E	C, D	3.3.12.A, B
C16. Compare/contrast the processes of spermatogenesis and oogenesis.	I	G	3.3.12.C
D16. Explain how hormones control the activities of male and female reproductive organs and the development of the secondary sex characteristics.	I	G, H	3.1.12.C 3.3.12.B
E16. Describe the major events that occur during a menstrual cycle.	I	G	3.3.12.B
F16. Define pregnancy, and describe the process of fertilization.	C	G	3.3.12.A
G16. Discuss the structure, formation and function of the placenta.	C	C, D, E	3.3.12.A, B
H16. Trace the general path of blood through the fetal cardiovascular system.	C	A, D	3.3.12.A
I16. Describe the birth process and explain the role of hormones in this process.	C	G, H	3.3.12.A, B 3.1.12.E

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Curriculum Form

Name of Course: Human Anatomy and Physiology
Name of Unit : 9 – Fetal Pig Dissection
Essential Question: How do the organ systems of the fetal pig compare to those of a human being?

Unit Objectives/Key Questions			
A. Perform a dissection of a preserved fetal pig.	E	J, K	3.2.12.C 3.7.10.A, B
B. Identify, with correct terminology, the various anatomical terms used to describe the regions of a specimen.	E	C	3.3.12.A
C. Locate and identify selected external and internal structures and features of the fetal pig.	E	C, D	3.3.12.A
D. State the function(s) of selected structures/organs of the fetal pig.	E	A, E	3.3.12.A, B
E. Compare the organ systems of the fetal pig with that of a human being.	E	A	3.1.12.D 3.3.12.A, B

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III. Course Assessments

Check types of assessments to be used in the teaching of the course.
(Provide examples of each type.)

__X_ Objective Tests/Quizzes
____ Constructed Responses
____ Essays
__X_ Reports
__X_ Projects
____ Portfolios
__X_ Presentations
__X_ Performance tasks
__X_ Lab Activities
____ Response Journals
____ Logs
__X_ Computer Simulations
____ Research Papers
__X_ Class Participation
__X_ Notetaking
__X_ Daily Assignments
____ Writing Samples
____ _____

Provide copies of common assessments that will be utilized for all students taking this course. Overall course/grade level standards will be measured by a common course assessment. Unit objectives will be measured on an ongoing basis as needed by the classroom teacher to assess learning and plan for instruction. List common assessements below and recommended date/time frame for administration (at least quarterly).

Name of Assessment	When given?
1. Unit Tests	At the completion of each unit
2. Lab Reports	At the completion of each lab activity
3. Tissue Project	At the completion of the unit on tissues
4. Digestive System Project	At the completion of the unit on absorption/excretion
5. Fetal Pig Lab Practical	At the completion of the fetal pig dissection
6. Final Exam	At the end of the semester

IV. Expected levels of achievement

Current grading scale:

As defined in the current grading policy outlined in the student handbook.

PA Proficiency Levels
Advanced Proficient
Basic Below Basic

A+	98-100
A	95-97
A-	92-94
B+	89-91
B	86-88
B-	83-85
C+	80-82
C	77-79
C-	74-76
D+	71-73
D	68-70
D-	65-67
F	0-64

Attach rubrics, checklists, or other documentation noting how levels of proficiency will be determined for common assessments. The following scoring documents have been developed for this course:

1. Rubric for Tissue Project (attached)
2. Rubric for Digestive System Project (attached)
3. Fetal Pig Lab Practical Requirements (attached)

Anatomy/Physiology
Mr. Eurich

Name _____
Date _____
Sect _____

Tissue Project Directions and Grading Rubric

1. You are to prepare a graphic organizer/poster illustrating the four (4) main categories of tissues. For each category of tissue you should include general characteristics and functions. Branching off of the category you should include pictures/illustrations representing each of the specific types of tissue identified in your summary charts and their locations in the body.

2. To gather the necessary information for the poster you should consult you text, class notes, summary chart on tissues, your lab report on tissue types and the internet.

3. Your poster should include a title, appropriate relationships among the categories and specific tissue types, all required information and should be "visually appealing" to the eye.

4. Your project will be worth 100 points. The following rubric will be used to grade your finished project:

CATEGORY	4	3	2	1	Score
Attractiveness X5	The poster is exceptionally attractive in terms of design, layout, and neatness.	The poster is attractive in terms of design, layout and neatness.	The poster is acceptably attractive though it may be a bit messy.	The poster is distractingly messy or poorly designed.	
Required Elements X5	The poster includes all required elements as well as additional information.	All required elements are included on the poster.	Most of the required elements are included on the poster.	Several required elements were missing on the poster.	
Content/Accuracy X5	All of the facts are accurately displayed and arranged on the poster.	The majority of the facts are accurately displayed and arranged on the poster.	Most of the facts are accurately displayed and arranged on the poster.	Few of the facts are accurately displayed and arranged on the poster.	
Graphics/Clarity X5	The pictures/illustrations are excellent examples of the specific tissues.	All of the pictures/illustrations represent the specific tissues.	Most of the pictures/illustrations represent the specific tissues.	Few of the pictures/illustrations represent the specific tissues.	
Mechanics X5	Capitalization and punctuation are correct throughout the poster.	There are few errors in capitalization or punctuation.	There are several errors in capitalization or punctuation.	There are many errors in capitalization or punctuation.	
				Total	

Anatomy/Physiology
Mr. Eurich

Name _____
Date _____
Sect _____

Digestive System Project Directions and Grading Rubric

1. You are to prepare a project describing a well-balanced meal and follow it through the digestive system describing what happens to it as it passes through each major organ until it exits the body. You should include: mouth, esophagus, stomach, small intestine, large intestine, rectum/anus, liver, gall bladder, pancreas, salivary glands and the associated fluids/enzymes.

2. To gather the necessary information for the project you should consult you text, class notes, summary chart, diagrams and the internet/reference texts.

3. Your project should include a title/title page/title slide, description of the well-balanced meal, what happens to the six (6) substances that meet the requirements of a food as it passes from one (1) digestive organ to another.

4. Your project will be worth 100 points. The following rubric will be used to grade your finished project:

CATEGORY	4	3	2	1	Score
Attractiveness X5	The project is exceptionally attractive in terms of design, layout, and neatness.	The project is attractive in terms of design, layout and neatness.	The project is acceptably attractive though it may be a bit messy.	The project is distractingly messy or poorly designed.	
Required Elements X5	The project includes all required elements as well as additional information.	All required elements are included on the project.	Most of the required elements are included on the project.	Several required elements were missing on the project.	
Content/Accuracy X5	All of the facts are accurately recorded.	The majority of the facts are accurately recorded.	Most of the facts are accurately recorded.	Few of the facts are accurately recorded.	
Graphics/Clarity X5	The pictures, illustrations, descriptions explain the content well.	All of the pictures, illustrations, descriptions explain the content adequately.	Most of the pictures, illustrations, descriptions explain the content.	Few of the pictures, illustrations, descriptions explain the content.	
Mechanics X5	Capitalization and punctuation are correct throughout the project.	There are few errors in capitalization or punctuation.	There are several errors in capitalization or punctuation.	There are many errors in capitalization or punctuation.	
				Total	

Human Anatomy/Physiology
Mr. Eurich

Name _____
Date _____
Sect _____

Lab: Fetal Pig Dissection

At the conclusion of this dissection you should be able to:
1. Differentiate between male and female fetal pigs.
2. Identify the external & internal structures of the fetal pig and state their function(s).
3. Describe changes in circulation that occur between the fetal pig stage and the adult stage.
4. Demonstrate your dissection skill and your intimate knowledge of the fetal pig to your instructor.

External Anatomy:

Head, neck, trunk, tail
Eyelids, external ears (pinnae), external nostrils (nares)
Legs, toes
Umbilical cord, umbilical arteries, umbilical vein
Mammary papillae
Anus, urogenital opening (□,□)

Internal Anatomy:

Head:

Tongue, taste buds (papillae), teeth
Hard palate, soft palate
Epiglottis, glottis, opening to esophagus, opening to nasopharynx

Neck:

Thymus gland, thyroid gland, larynx, trachea, esophagus

Thoracic Cavity:

Pleural cavity, parietal pleura, visceral pleura
Mediastinum, visceral pericardium
Heart, r/l atria, r/l ventricles, coronary vessels, valves
Vena cava, aorta, pulmonary arteries/veins, ductus arteriosus
Lungs, trachea
Diaphragm

Abdominopelvic Cavity:

Abdominal cavity, pelvic cavity, parietal peritoneum, visceral peritoneum
Liver, gall bladder, bile duct
Pancreas, pancreatic duct
Esophagus, stomach, pyloric sphincter, cardiac sphincter, rugae
Small intestine, duodenum, villi, caecum, large intestine, rectum
Mesentery
Spleen
Kidneys, ureters, urinary bladder, urethra, urogenital opening
Scrotal sacs, testes, epididymis, vas deferens, penis
Ovaries, fallopian tubes, uterus, vagina, urogenital sinus, urgoenital opening

Cranial Cavity:

Cerebrum, cerebellum, medulla oblongata, optic chiasm, olfactory lobes