Grande Prairie Regional College

25th Anniversary 1991/92

GRANDE PRAIRIE REGIONAL COLLEGE

BIOLOGY 130

COURSE OUTLINE 1991/1992

INSTRUCTOR: Nancy Lamoureux

OFFICE: E 310 Enter through office bank 307

PHONE: 539-2835

OFFICE HOURS: TBA or by appointment

TEXTBOOK: Inquiry into Life
sixth edition
Author: Mader

SUPPLIES: binder
loose leaf paper
plain paper
stapler
pencil
lab coat recommended
lab manual: on loan to the student

COURSE GOALS:

This course is designed to provide the student with an understanding of biological concepts, principles, and biology related social issues, and to develop laboratory and other scientific skills. This course deals with cell structure and function, and human anatomy and physiology.

ATTENDANCE:

Regular attendance is expected from all students and is essential for passing the course. Students who miss classes will find themselves falling behind and failing. **Note that if you miss 20% or more of the classes you will not be permitted to write the final exam.** Classes will start on time, so please do not be late.

TESTS, QUIZZES AND EXAMS:

There will be several tests and quizzes throughout the term. Absence from tests, quizzes or exams will result in a mark of zero.

LABS:

Your Laboratory instructor is Medha Karnik. Medha will give you lab information at the first laboratory period.

FAILURE TO SUBMIT THREE OR MORE LAB REPORTS WILL RESULT IN BEING BARRED FROM THE FINAL EXAM.

EVALUATION:

TESTS AND QUIZZES	30%
LABS	20%
MIDTERM	20%
FINAL	30%
TOTAL	100%

GRANDE PRAIRIE REGIONAL COLLEGE GRADING PROCEDURES

9 POINT SCALE	PERCENTAGE EQUIVALENCE	DESIGNATION
9	90 - 100	
8	80 - 89	EXCELLENT
7	72 - 79	
6	65 - 71	GOOD
5	57 - 64	
4	50 - 56	PASS
3	45 - 49	FAIL
2	26 - 44	
1	0 - 25	

LEARNING OBJECTIVES

UNIT 1: CELL STRUCTURE AND FUNCTION

(text reference: chapters 2 and 3)

1. Differentiate between the light microscope and the electron microscope.

2. Define photomicrograph, compound microscope, resolving power magnification, transmission electron microscope, scanning electron microscope, electromicrograph

3. Summarize the cell theory.

4. Distinguish between eukaryotic and prokaryotic cells.

5. Describe the structure and function of the following cell parts: plasma membrane, cytoplasm, nucleus, mitochondria, lysosomes, endoplasmic reticulum, micofilaments, microtubules, vacuoles, vesicles, ribosomes, golgi apparatus

6. Label the above cell parts on a diagram, photomicrograph or electron micrograph.

7. Define: organelle, permeable, semipermeable, and selectively permeable membranes.

8. Define and explain: diffusion, concentration gradient, osmosis, osmotic pressure.

9. State and explain the factors affecting diffusion.

10. Define: hypotonic, hypertonic, isotonic, crenated cell, lysis, plasmolysis and turgor pressure.

11. Predict the results of placing cells in solutions of various tonicities (strengths).

12. Define and explain: facilitated transport, and active transport.

13. Explain the methods of bulk transport; endocytosis, pinocytosis, phagocytosis, exocytosis.

UNIT 2: CELL METABOLISM

(text reference: chapter 5)

1. Define metabolism, metabolic pathway.

2. Define: enzyme, substrate, enzyme-substrate complex, energy of activation, coenzyme.

3. Explain the two theories of enzymatic function.

4. Describe how concentration, competitive inhibition and denaturation affect enzyme action.

5. Describe the role of ATP in metabolism.

6. Write the overall word and chemical equations for aerobic cellular respiration.

7. Outline the main metabolic subpathways of aerobic respiration their contribution to ATP, Carbon dioxide, and water production.

8. Describe the use of other molecules such as fats, amino acids, and proteins as energy sources in cellular respiration.

9. Compare aerobic and anaerobic respiration.

UNIT 3: HUMAN ORGANIZATION

(text reference: chapter 9)

1. Distinguish between the different levels of biological organization: cell, tissue, organ. organ system and organisms.

2. Describe the structure and function of the four basic tissue types: epithelial tissue, connective tissue, muscle tissue, and nervous tissue.

3. Name the major organ systems and state the functions of each system.

4. Name and locate the major body cavities, and list the major organs found in these cavities.

5. Define homeostasis, and negative feedback.

6. Explain the importance of homeostasis for living organisms.

UNIT 4: DIGESTION AND NUTRITION

(text reference: chapters 1 and 10)

1. Define synthesis and hydrolysis.
2. Identify the structural differences between carbohydrates, lipids and proteins.
3. Define digestion.
4. Describe the structure and function of the following parts of the digestive system: mouth, esophagus, stomach, small intestine and large intestine.
5. State the function of the following digestive accessory organs: salivary glands, liver, gall bladder and pancreas.
6. Describe some common ailments or disorders of the digestive system.
7. Name the major digestive enzymes, their substrates and products, site of origin, site of action, homeostatic control, and optimum pH.
8. Discuss the how the structure of the small intestine is related to its function.

UNIT 5: CIRCULATION

(text reference: chapters 11 and 12)

1. State the general functions of the circulatory system.
2. Describe the structure and function of arteries, veins and capillaries.
3. Describe the structure and function of the heart and its major blood vessels.
4. Trace the path of the blood through the heart.
5. Discuss heart beat and the control of heart beat.
6. Discuss blood pressure and the factors affecting blood pressure. Discuss the nature and causes of hypertension.
7. Distinguish between pulmonary and systemic circuits of circulation. List the paths of systemic circulation.

8. Discuss the structure and function of the lymphatic system.

9. Outline the nature and causes of common circulatory diseases and disorders.

10. Describe the function of the following components of blood: plasma, erythrocytes leukocytes and platelets.

11. Discuss the transportation of respiratory gases in the circulatory system.

UNIT 6: BREATHING AND RESPIRATION

(text reference: chapter 14)

1. State the general functions of the respiratory system.

2. Discuss the structure and function of the following respiratory system structures: nostril, nasal cavity, pharynx epiglottis, larynx, trachea, bronchi, bronchioles, alveoli, lungs, pleural membranes.

3. Label the above parts on a diagram of the respiratory system.

4. Describe the mechanism of breathing (inspiration and expiration).

5. Explain external and internal respiration.

6. Describe the role of hemoglobin and blood plasma in the transport of blood gases.

7. Discuss how breathing is controlled.

8. List and briefly describe some respiratory diseases and disorders.

9. Identify the effects of smoking on the respiratory system and the body in general.

UNIT 7: EXCRETION

(text reference: chapter 15)

1. List the various organs and their contribution to the excretory system.

2. State the functions and importance of the excretory

2. State the functions and importance of the excretory system.

3. Describe the structure and function of the following urinary tract structures: kidneys, ureter, bladder, and urethra.
4. Describe the structure of the following kidney structures: cortex, medulla, pyramids, renal pelvis, renal artery and renal vein.

5. Label the structures listed in #3 an #4 on a diagram.

6. Draw and fully label the nephron and its circulatory pattern.

7. Outline the process of urine formation in the kidney by discussing the role of each part of the nephron.

8. Describe the regulation of blood volume and how the kidney helps to regulate blood pH.

9. Discuss excretory diseases and disorders.

UNIT 8: NERVOUS SYSTEM

(text reference: chapter 16)

1. Summarize the functions of the nervous system.

2. Differentiate between the peripheral nervous system and the central nervous system.

3. Describe the structure and function of the three major types of neurons: sensory neurons, interneurons, and motor neurons.

4. Describe the reflex arc.

5. Explain the mechanism of a nerve impulse by defining action potential, upswing, downswing and repolarization.

6. Define: synapse, neurotransmitter, refractory period, reaction time, all or none response.

7. Discuss the transmission of a nerve impulse across a synapse.

8. Describe the structure and function of the autonomic nervous system and its two divisions, the sympathetic and the parasympathetic nervous systems.

9. Discuss the structure and function of the brain and its major parts: medulla, pons, cerebellum, hypothalamus, thalamus and cerebrum.

UNIT 9: ENDOCRINE SYSTEM

(text reference: chapter 19)

1. Compare the operations of the nervous system with the endocrine system.

2. Differentiate between exocrine and endocrine glands.

3. Differentiate between protein hormones and steroid hormones.

4. Discuss negative feedback and positive feedback giving examples of each.

5. Outline the two mechanisms of enzymatic action.

6. Name the hormones and their functions of the pituitary gland, thyroid gland, parathyroid glands, adrenal glands and the pancreas.

7. Label the above glands on a diagram.