Supporting Services – Tutoring Services available in Math & Science Tutorial Center, PH 132

ATTENDANCE POLICY: The University’s attendance policy will be followed in this course.

NOTE: Any student requiring alternative formats for testing and/or handouts for this course, or other types of accommodations, due to a handicapping condition, should advise the instructor within the first week of classes.

COURSE DESCRIPTION: This is the second part of a survey course in General Biology. The topics covered in this course are an overview of fungi, plant and animal taxonomy, a comparative study of the integumentary, muscular, skeletal, nervous, endocrine, circulatory, immune, respiratory, digestive, excretory, and reproductive systems. Besides covering these topics, the course is designed to: 1) help students recognize biological issues in daily life; 2) foster the development of academic skills: listening, studying, memorizing, writing, computing, and critical thinking.

COURSE OBJECTIVES: The following learning objectives will be addressed in this course. Each topic represents a broad study area in biology.

Objective 1. Demonstrate an understanding of Taxonomy (Chapters 1, 27) and Animals (Chapters 30, 31)
Objective 2. Demonstrate an understanding of Unifying Concepts of Animal Structures and Functions (Chapter 11)

Objective 3. Demonstrate an understanding of Skeletal and Muscular Systems (Chapter 19)
Objective 4. Demonstrate an understanding of Nutrition and Digestion (Chapter 14) and The Urinary System (Chapter 16)

Objective 5. Demonstrate an understanding of the Cardiovascular System and Respiration (Chapters 12, 15)
Objective 6. Demonstrate an understanding of the Immune System (Chapter 13)

Objective 7. Demonstrate an understanding of the Endocrine System (Chapter 20) and the Nervous System and the Senses (Chapters 17, 18)
Objective 8. Demonstrate an understanding of Reproduction and Embryonic Development (Chapters 21, 22)


Objective 10. Review scientific literature and complete writing assignments
EVALUATION AND MINIMUM STANDARDS

Testing
During the semester four exams will be given that will evaluate the objectives of the course. The first exam will test objectives 1-2, the mid-term exam will test objectives 3-4, the third exam will test objectives 5-6 and the final exam will test objectives 7-8.

Writing Exercise(s)
To achieve objective 10, (an) acceptable written report(s) must be prepared. The lecture/instructor will evaluate the assignments.

Tutorial Assistance:
If students do not perform satisfactorily on a test, they should seek help from their instructors or tutors in the Mathematics and Science Center (PH 132)

Summary of Evaluation Procedure

<table>
<thead>
<tr>
<th>Test</th>
<th>No. of Questions</th>
<th>Objectives</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test 1</td>
<td>50</td>
<td>1-2</td>
<td>100</td>
</tr>
<tr>
<td>Mid-Term</td>
<td>50</td>
<td>3-4</td>
<td>100</td>
</tr>
<tr>
<td>Test 3</td>
<td>50</td>
<td>5-6</td>
<td>100</td>
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<tr>
<td>Final</td>
<td>50</td>
<td>7-8</td>
<td>100</td>
</tr>
<tr>
<td>Critical thinking exercises and quizzes</td>
<td>9</td>
<td></td>
<td>100</td>
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<tr>
<td>Writing assignments</td>
<td>10</td>
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<tr>
<td><strong>Total Points Possible</strong></td>
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Grade Assignments

<table>
<thead>
<tr>
<th>Grade</th>
<th>Grade Percentiles</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90-100%</td>
</tr>
<tr>
<td>B</td>
<td>80-89%</td>
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<tr>
<td>C</td>
<td>70-79%</td>
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<tr>
<td>D</td>
<td>60-69%</td>
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<tr>
<td>F</td>
<td>Below 60%</td>
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</tbody>
</table>

All students with D or F as a Final grade will be required to repeat the course, a university college core course requirement.

DETAILED COURSE OBJECTIVES

Objective 1. Taxonomy and Animals (Chapters 1, 27, 30, 31)

Students should be able to:
1. Describe the basic principles of systematics
2. Explain phylogenetic lineage; name kingdoms of classification scheme
3. Describe evidences of origin of life
4. Explain the basic characteristics of animals
5. List the distinguishing characteristics of Phyla: Porifera, Cnidaria, Platyhelminthes, Nematoda, Mollusca, Annelida, Arthropoda, Echinodermata and Chordata
6. List the distinguishing characteristics of the classes in vertebrata
7. Distinguish between phyla in Kingdom Animalia based on species diversity

VOCABULARY
Binomial nomenclature, genus, species. Blastula, gastrula, larva, metamorphosis radial symmetry, amoebocyte, polyp, medusa; cnidocytes; bilateral symmetry, anterior, posterior, dorsal, ventral, coelom mantle, radula; exoskeleton, molting; nerve cord, notochord; ectothermic, endothermic.

Objective 2. Unifying Concepts of Animal Structures and Functions (Chapter 11)

Students should be able to:
1. Describe characteristics of cells, tissues, organ systems and the integumentary system
2. Identify the locations, functions, and types of epithelial tissues, connective tissues, muscle tissues and nervous tissues
3. Identify the structures and the major functions of the major organ systems of the human body

VOCABULARY
Tissue, basement and mucous membrane; connective tissues, cartilage; muscles-skeleton, cardiac, and smooth; organ systems; homeostasis, negative feedback.

Objective 3. Skeletal and Muscular Systems (Chapter 19)

Students should be able to:
1. Name and locate the major bones in the human skeletal system
2. Distinguish between the cartilage tendons and ligaments
3. Distinguish between the axial and appendicular skeletal systems
4. Describe the functions of the skeletal system
5. Distinguish between the cartilaginous and fibrous joints
6. Explain the sliding filament theory of muscle contraction

VOCABULARY
Hydrostatic skeleton, exoskeleton; endoskeleton; axial and appendicular skeleton; joints-ball-and-socket, hinge, and pivot; arthritis, osteoporosis; red and yellow bone marrow; tendons; myofibril, sarcomere, thick/thin filament

Objective 4. Nutrition and Digestion (Chapter 14)

The Urinary System (Chapter 16)

Students should be able to:
1. List the names and functions of the major parts in the digestive system
2. State the functions of the oral, gastric, pancreatic and intestinal digestive enzymes
3. Name the parts of the kidney from the micro- to the macro- levels
4. List the parts and functions of the urinary system

VOCABULARY
Omnivores, herbivores, carnivores, suspension/substrate/fluid feeders; peristalsis, pyloric sphincter; gastrin; acid chyme, gastric ulcers; ruminant; basal metabolic rate; essential fatty acids, RDAs; essential amino acids; minerals; LDLs, HDLs; ectotherm, endotherm, thermoregulation, osmoregulation, excretion; hibernation, aestivation, osmoregulation.

Objective 5. Cardiovascular System and Respiration (Chapters 12, 15)

Students should be able to:
1. Describe the fundamental aspect of respiration
2. Explain how carbon dioxide concentrations in the blood affect breathing
3. List the parts of the human respiratory system and give their functions
4. Describe the basic aspects of the circulation
5. Distinguish between arteries and veins
6. Give the function of the SA node and AV node

BIO 128 lecture syllabus
7. Name the chief components of blood and describe their characteristics

**VOCABULARY**
Alveoli, emphysema; hyperventilation; open/closed circulation; pulmonary/systemic circuits; cardiac cycle, diastole, systole; pacemaker, SA node, AV node; hypertension; RBCs, anemia; stem cells, leukemia

**Objective 6. The Immune System (Chapter 13)**

Students should be able to:
1. List the general structure of the lymphatic system
2. Distinguish between specific immunities and non-specific immunities
3. List various cells of the immune system and give their functions
4. Distinguish between humoral and cell mediated immunity
5. Describe the inflammatory process and its role in allergic reactions

**VOCABULARY**
neutrophils, macrophages, NK cells, interferons, complement proteins; antigen, antibody, immunity, vaccination, active/passive immunity; B cells, T cells, humoral/cellular immunity; antigen receptors, antigenic determinants; effector cells, primary/secondary immune response, memory cells; monoclonal antibodies; T cells; autoimmunity; allergens, anaphylactic shock.

**Objective 7. The Endocrine System (Chapter 20)**

**The Nervous System and The Senses (Chapters 17, 18)**

Students should be able to:
1. Name the basic aspect of the endocrine system
2. Identify and give the functions of the hormones produced in the CNS
3. Identify and give the functions of the hormones produced by the reproductive organs, adrenal gland, pancreas, thyroid, parathyroids, stomach, small intestine and placenta
4. Describe the negative feedback control and hormonal levels
5. Discuss the basic characteristics of neurons and neural control system
6. Describe the general structure of a CNS neuron and a PNS neuron
7. Describe the changes in the action potential from a resting neuron to an activated neuron
8. State function of a chemical synapse
9. Distinguish between the somatic and autonomic nervous systems
10. Describe the sympathetic and parasympathetic nervous system
11. List the general areas of the human brain and their functions
12. List the human senses and their components

**VOCABULARY**
Hormone, neurotransmitters, prostaglandins; steroid/nonsteroid hormones; ADH, TSH, ACTH, LH, GH, prolactin, endorphin; thyroxine, goiter; PTH; glucagon; diabetes, hypoglycemia; epinephrine, norepinephrine; corticosteroids, mineralocorticoids, glucocorticoids; estrogen, progesterin, androgen, testosterone. Sensory input, motor output, integration, neurons, cell body, dendrites, axon, myelin sheath, nodes of Ranvier, CNS, PNS, ganglia, interneuron; resting potential; action potential, threshold potential; neurotransmitter; biogenic amines; cranial/spinal nerves, somatic/autonomic nervous system; sympathetic/parasympathetic neurons; medulla oblongata, pons, cerebrum, thalamus, hypothalamus, biological clock, cerebrum, corpus callosum, basal ganglia; EEG, SW/REM sleep; short/long term memory; sensory transduction, receptor potential; blind spot, accommodation; visual acuity, nearsightedness, farsightedness, astigmatism; rods, cones, rhodopsin, photopsin; cochlea.

**Objective 8. Reproduction and Embryonic Development (Chapters 21, 22)**

Students should be able to:
1. State the roles and names of male and female reproductive organs
2. List the male and female reproductive hormones
3. Describe the process of spermatogenesis and oogenesis
4. List the effectiveness of various birth control methods
5. Describe the process of cleavage to implantation
6. Distinguish between fetal and adult circulations
7. List the major events in the formation of a fetus from a zygote

VOCABULARY
Sexual/asexual reproduction, budding, fission, fragmentation, regeneration; hermaphroditism, external fertilization; spermatogenesis; primary/secondary spermatocyte, oogenesis; ovarian/menstrual cycle, menstruation; orgasm, STDs, contraception; vasectomy, tubal ligation, MAPs; fertilization, acrosomes; cleavage, blastula, gestation, blastocyst, trophoblast, placenta, extraembryonic membrane, amnion, yolk sac, allantois chorion, HCG, chorionic villi, fetal alcohol syndrome; in vitro fertilization (IVF).

Objective 9. Critical thinking exercises and quizzes.
Individual instructor will determine format, frequency, and scoring of critical thinking exercise(s) and quizzes.

Objective 10. Writing assignment(s)
Students will research topics critical to learning and understanding contemporary topics in biology, and write a scientific review paper based on information gathered using library and information technology tools.

Reading/Writing Literacy
Students will demonstrate enhanced competence in reading/writing literacy knowledge and skills in biology.

1. Students will be able to read and respond in writing to challenging texts that demand critical thinking in Biology.
   Exercise or Activity: Scientific writing assignment
   Performance Indicators:
   Students will
   • Use appropriate writing conventions to organize and categorize information/materials.
   • Use information from library and information technology tools, scientific journals, books, magazines, newspapers, textbooks, audio and media presentations, and from such forms as basic charts, graphs, maps, and diagrams to write for critical analysis and evaluation

2. Students will be able to demonstrate effective use of various patterns for organizing and developing written communication in biology.
   Exercise or Activity: Scientific writing assignment
   Performance Indicators:
   Students will
   • Address assigned topics, providing adequate and specific supporting evidence.
   • Identify the pattern of development (narration, description, process, comparison-contrast, illustration).

3. Students will be able to recognize and use correctly and effectively the rules and conventions of standard English as applied in scientific communication.
   • Students will be able to write various types of sentences (simple, compound, complex) that convey clear thought, using correctly the grammar and mechanics of standard English.
• Students will be able to parse sentences in texts written by professional writers and by their peers, identifying what makes the sentences work to convey a clear message.

**Exercise or Activity:** *Scientific writing assignment*

**Performance Indicators:**

Students will

- write personal responses to scientific literature and vocabulary,
- communicate the meaning of scientific literature by using appropriate citation and documentation techniques.

**Quantitative literacy**

Students will demonstrate enhanced competence in quantitative literacy knowledge and skills

1. Students will demonstrate knowledge of fundamental mathematical concepts, symbols, and principles in performing basic computational operations

**Exercise or Activity:** *Scientific writing assignment*

**Performance Indicators:**

Students will

- Evaluate basic mathematical calculations used in scientific research such as preparation of media, or buffers

2. Students will interpret mathematical, quantitative models (such as formulas, graphs, charts, tables and maps) that describe real-world phenomena.

**Exercise or Activity:** *Scientific writing assignment*

**Performance Indicators:**

Students will

- Interpret the tables, charts, graphs and figures used in scientific literature
- Evaluate mathematical data from several studies, and draw pertinent conclusions

3. Students will demonstrate competence in analytical and quantitative reasoning skills as these apply to real world situations

**Exercise or Activity:** *Scientific writing assignment*

**Performance Indicators:**

Students will

- Evaluate quantitative data from scientific literature associated with human health
- Interpret the data to discover trends and draw reasonable scientific conclusions

**Information literacy**

Students will demonstrate enhanced competence in information literacy knowledge and skills

1. Students will be able to identify and articulate their information needs in the process of defining a problem, question, or project for research

**Exercise or Activity:** *Scientific writing assignment*

**Performance Indicators:**

Students will

- Take a short seminar on defining problems, identifying research topics, and gathering scientific information.

2. Students will be able to use library and information technology tools and resources to carry out research
Exercise or Activity: Scientific writing assignment
Performance Indicators:
Students will

- Visit the library and learn how to use various scientific databases such as Science direct and Pubmed to gather information on the research topic assigned.

3. Students will be able to design and execute a research project using a systematic process to collect, analyze, and present information in written formats, properly incorporating, citing, and documenting resources.

Exercise or Activity: Scientific writing assignment
Performance Indicators:
Students will

- Systematically evaluate and analyze the data collected and complete the research paper citing the references in the text with a proper literature cited section at the end.