

General Biology

Biology 128 (Honors)

Alabama State University
Department of Math and Science

Spring Semester- Credit Hours-3

Textbook: Biology 6th Edition by Campbell and Reece

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).

Attendance Policy: The University's attendance policy will be followed in this course.

Note: Any student requiring alternate 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 class.

Course Description: This is a General Biology course designed to serve honor students who have shown their dedication in learning biology. This course entails a wide array of biological phenomena and each phenomenon will be rigorously discussed. A variety of teaching tools will be employed to achieve presentational clarity of the subject. Students will be challenged with various activities in the class to test their intelligence. Each learning objective will consist of several reasoning and thought provoking concepts, which will be carried out in the form of group discussion or mini seminar sessions.

Course Goals: This course has the following major goals:

1. To cover various biological phenomena in depth.
2. To provide students an opportunity to be actively involved in learning most recent biological principles and theories.
3. To provide students an opportunity to express creativity through group discussions, seminars, and other class room activities.
4. To implement a rigorous methodology to enable students with reading and comprehending scientific articles related to human and mammalian biology.
5. To develop students' skills in writing, analytical thinking, and problem solving with an emphasis on application of every-day biological concepts.
6. To familiarize students with use of databases, internet, and literature search.

Summary of Evaluation Procedure

Test	No. of Questions	Objectives	Points
Test 1			50
Mid-term	50	3-4	100
Test 3	50	5-6	100
Final	50	7-8	100
Writing exercises, quizzes and assignments		9-10	200
Total Points Possible			600

1-2

Grade Assignments

Grade	Grade Percentile
A	90-100%
B	80-89%
C	70-79%
D	60-69%
F	Below 60%

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

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 final exam will test objectives 7-8.

Writing Exercise (s)

To achieve objective 9, (an) acceptable written report(s) must be prepared. The lecture instructor will evaluate the assignment(s).

Description of Tests and Classroom activities

Test 1	Objectives 1 & 2
Test 2 (Midterm)	Objectives 3 & 4
Test 3	Objectives 5 & 6
Test 4 (Final)	Objectives 7 & 8
Scientific Paper/Presentation	Objectives 9 & 10

Test 1-4 will consist of objective questions. To pass an objective, the student must earn a minimum of 70% of the total points for that objective.

Assignments will be given in the form of study guides and scientific article summaries. They are to be completed by the students and turned in on their due dates.

Scientific Paper will count as a test grade. You will be required to write a 10 page research paper using the internet, scientific article from journals and books to collect information for the paper. An outline and format will be given to you to follow.

Presentations will consist of the research paper topic chosen by you. The presentation will also count as a test grade. An outline and format will be given to you to follow.

Group Discussions are designed to discuss the topics from the textbook, papers and other sources. All students are required to participate and discuss the topic. Group discussions will count as an assignment grade.

Content Areas:

1. Fungi, Animals (Invertebrates and vertebrates) and Plants
2. Integumentary System and an Overview of Human Organs
3. Human Skeleton System
4. Digestive System and Control of Internal Environment
5. Circulatory System and Respiration
6. Immune System
7. Nervous System and Endocrine System
8. Human Reproductive System
9. Scientific Paper
10. Presentation/Discussion

Detailed Course Objectives:

Objective 1. Fungi, Animals (invertebrates and Vertebrates) and Plants
(Chrs. 31-33, 34 & 38)

Subtopics:

1. Fungal divisions, nutrition and fungal evolution
2. Invertebrate diversity, overview of invertebrates
3. Vertebrate diversity, overview of vertebrates
4. Plant reproduction and development

Students should be able to:

1. Identify various divisions of fungi with examples, their mode of nutrition, and the impact of fungi on environment and animals
2. Explain characteristics of invertebrate and vertebrate animals
3. Discuss salient features of plants and their importance

Objective2. Integumentary System and an Overview of Human Organs(Ch. 40)

Subtopics:

1. Functions of animal tissue
2. Bioenergetics for animal functions
3. Homeostasis

Students should be able to:

1. List the structure and functions of animal tissue
2. Describe the importance of bioenergetics in body functions
3. Discuss the mechanism of Homeostasis

Objective 3. Human Skeletal System (Ch. 49)

Subtopics:

1. Skeleton support and protection in animals
2. Muscular contraction and movement of the skeleton
3. Mechanism and control of muscle contraction

Students should be able to:

1. Describe the role of the skeleton in protecting the animal body
2. Discuss the significance of movement in animals
3. Summarize the mechanism of muscle and skeleton interaction and movement

Objective 4. Digestive System and Control of Internal Environment (Ch. 41)

Subtopics:

1. Food digestion, absorption and elimination
2. Mammalian digestive system
3. Human diet and nutrition
4. Control of the internal environment

Students should be able to:

1. Summarize the various stages of food processing
2. Name the components of digestion and their role in digestion
3. Discuss the importance of diet, cellular work and biosynthesis
4. Explain the mechanism of controlling internal environment (solute-solvent balance)
5. Enumerate the components of the urinary system and the function and structure of kidneys

Objective 5. Circulatory System and Respiration (Ch. 42)

Subtopics:

1. Circulatory system in invertebrates and vertebrates
2. Pulmonary and systemic circuits
3. Blood composition and function
4. Cardiovascular diseases
5. Human respiratory system

Students should be able to:

1. Explain blood circulation through the pulmonary and systemic circuits
2. discuss the elements of blood
3. list cardiovascular diseases affecting human population
4. exemplify the supply of oxygen for cellular respiration
5. Discuss the mechanism of respiration in humans

Objective 6. Immune System(Ch. 43)

Subtopics:

1. Nonspecific immune response
2. Specific immune response
3. Cellular immunity
4. Humoral immunity
5. Role of T cells
6. Blood groups and autoimmune disease

Students should be able to:

1. Discuss the elements of the immune system
2. Summarize nonspecific and specific immune systems
3. Distinguish between cellular and humoral immunity
4. Explain the role of T cells and complementary systems to prevent diseases
5. Enumerate ABO blood groups and autoimmune diseases of humans

Objective 7. Nervous System and Endocrine System (Ch. 48)

Subtopics:

1. Neurons and supporting cells
2. Action potential
3. The vertebrate nervous system
4. The human brain
5. Sensory organs
6. Hormones
7. Vertebrate endocrine system

Students should be able to

1. Discuss components of the nervous system
2. Explain the mechanism of nervous communication
3. Summarize the mechanism of hearing, vision and other senses
4. List the important chemical signals
5. Name various hormones, their target and their site of production

Objective 8. Human Reproductive System (Ch. 46)

Subtopics:

1. Sexual and asexual reproduction
2. Human reproductive system
3. Spermatogenesis and oogenesis
4. Hormonal regulation of reproduction
5. Fetal development and methods to control pregnancy

Students should be able to:

1. Describe the concept of sexual reproduction
2. Exemplify human male and female reproductive systems
3. List contraceptive methods
4. Explain the process of fetal development

Objective 9. The Scientific Research Paper

Components

Title
Abstract
Introduction
Content

Significance of Paper to Humans
Characteristics of topic
Prevention of topic

Resent Advances in Research of the Topic
Conclusions
Discussions
References

Description of Components

Title: Should be typed on a separate page, in the middle of the page with name subject and date centered at the bottom of the page.

Abstract: Brief overview of the entire paper, which states the main points or finding of the research don. It should be at least one full paragraph (3-4 sentences).

Introduction: A more detailed summary of the paper. It emphasizes important points or facts stated in the abstract. It should be at least 1 full typed page.

Content: should contain all information pertinent to the research done. It may include several summaries of each subtopic mentioned in the introduction. It should be at least 3 full pages.

Resent Advances: Should reemphasize resent research findings as they relate to the topic. It should be at least one full paragraph.

Conclusion: Should summarize the entire paper and serve as a review of the research findings. It should be at least one full paragraph.

Discussion: Should give the opinion of the writer about the research findings. It should be at least one full paragraph.

References: Should list the sources from which information was obtained. It should include scientific journal articles, books and web sites.

Potential Topics

1. Acid Precipitation
2. Anabolic Steroids
3. Tay-Sachs Disease
4. How Pesticides Inhibit Enzymes
5. How Antibiotics Inhibit Enzymes
6. Hypercholesterolemia

- | | |
|-------------------------|---------------------------------|
| 7. Rotenone | 8. Cyanide |
| 9. Carbon Monoxide | 10. Oligomycin |
| 11. Green House Effect | 12. Tumors |
| 13. Carcinomas | 14. Sarcomas |
| 15. Leukemias | 16. Lymphomas |
| 17. Down Syndrome | 18. Klinefelter Syndrome |
| 19. Turner Syndrome | 20. Cystic Fibrosis |
| 21. Achondroplasia | 22. Huntington's Disease |
| 23. Ultrasound Imaging | 24. Genetic Screening |
| 25. Hemophilia | 26. Duchenne Muscular Dystrophy |
| 27. Cancers | 28. Human Genome Project |
| a. Prostate | 29. DNA Fingerprinting |
| b. Breast | 30. Cyanobacteria |
| c. Lung | |
| d. Colon and Rectum | |
| e. Bladder | |
| f. Melanoma of the skin | |
| g. Uterus | h. Kidney |
| I. Mouth and throat | j. Pancreas |
| k. Ovary | l. Stomach |
| m. Brain and nerve | n. Liver |
| o. Cervix | |

Any other disease affecting humans can be chosen as a topic. The above topics and other topics may be found in some of the scientific journals mentioned below(available at the ASU library): Science, Nature, Endocrinology, Experimental Cell Research, Journal of Clinical Microbiology, Journal of Bacteriology, Journal of Biological Chemistry, Journal of Immunology, the New England Journal of Medicine, Modern Medicine, etc. Some databases like Medline (www.nlm.nih.gov) and Health Info Trac can be helpful to find relevant material.

Objective 10. The Scientific Presentation

Students will make an oral presentation of 5 minutes on the topic selected for their research paper. Students will utilize modern instructional/ multimedia technology in making this presentation.

Components

Introduction
Epidemiology

- a. Incidence
- b. Control
- c. Distribution

Recent Advances in Research of the Disease
Conclusions
Discussion

ALABAMA STATE UNIVERSITY
DEPT. OF MATH & SCIENCE
GENERAL BIOLOGY LABORATORY HONORS (BIO 128) – Credit Hour - 01
Fall/Spring

Laboratory Manual: Exploring Biology in the Laboratory

Shree R. Singh & Karyn Scissum-Gunn

Instructor _____ Office Extension _____ Office Hours _____

Supporting Services- Tutoring/Audio-Visuals/Computer software
Math & Science Tutorial Center, PH 132 (8:00 a.m.-5:00 p.m., M-F)

Attendance Policy: Each student is expected to attend all lectures, seminars, laboratories and field work for each registered course, including the first class session. Attendance is required to verify official enrollment and continuance in each course. When students are absent from class for authorized reasons such as death in the family, illness, hindrance by true emergency situations or University activities, they will be allowed to make up assignments/ examinations that they missed. Instructors, of course, are not obligated to provide makeup opportunities for students who are absent, unless the absences have been officially approved. Official excuses can be obtained from the Office of Student Affairs.

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 course is focussed to expose honors and biology majors students with basic principles and theories of biology. This course enables students to be familiar with different plants, animals, fungi, and protozoans. The laboratory emphasizes the study of major systems of animals with a special thrust to mammals. Students in this laboratory course will get an opportunity to learn an array of systems viz. skeleton system, muscular system, integumentary system, digestive system, urinary system, reproductive system, immune system and nervous system. The study of these systems is facilitated by the use of live animals for dissection, video films, microscopy slides etc. Each laboratory exercise provides ample hands-on experience based on every day observation in life.

Course Goals:

To provide students the opportunity to learn the human and other animal organ systems. Thus the knowledge gained in this laboratory could be effectively used to improve the life of humans and other animals. The course has following major goals:

1. To familiarize students with plants, animals, fungi and protozoans.
2. To familiarize students with organ systems of animals with an emphasis on human systems.
3. To encourage students to explore the flora and fauna of the land for better understanding of nature.
4. To develop the student's skill in writing, reading, analytical thinking, and problem solving skills.

To meet the above goals, this course will focus on the following objectives. Each objective is diverse and covers different activities.

Objective*	Corresponding Labs in the Manual
1. Animal Kingdom I	Laboratory 15 & 16
2. Animal Kingdom II	Laboratory 17
3. Animal Organization	Laboratory 18
4. Basic Mammalian Anatomy I-Fetal Pig Anatomy	Laboratory 19
5. Musculoskeletal System	Laboratory 20
6. Digestive and Respiratory	Laboratory 19,25

- | | |
|---|--------------------|
| 7. Circulatory System | Laboratory 22 & 23 |
| 8. Basic Mammalian Anatomy II
(Urogenital, & Reproductive Systems) | Laboratory 21 & 25 |
| 9. Nervous System, and Senses | Laboratory 24 |
| 10. Survey of Human Diseases | |
| 11. Laboratory Assignments | |
| 12. Lab Report(s) | |

*Laboratory experiments may vary depending on the availability of instruments and supplies.

EVALUATION AND MINIMUM STANDARDS

Testing: During this laboratory course, students will be tested from each objective. The midterm and final exams will be comprehensive.

Number of Tests: There will be a total of four tests, this includes the midterm and final. Instructors may give additional quizzes during the semester.

Composition of Tests: Test items on the test may be multiple choice (MC), fill in the blanks (FB), matching (MT), completion (CP), and calculations (CAL). Midterm and final exams will contain practical lab questions inclusive of identification (PR). The number of these questions will be determined by the instructors. Each objective will be weighed equally in terms of testing. Writing exercises may consist of 1-3 lab reports. Students will be tested on the terms discussed in each objective.

Minimum Standard for Passing: To pass an objective students must obtain 70% of the points for each objective. To pass the course students must pass 8 out of 11 objectives and obtain 420 points out of 600. Students must pass objective 10 and 11 to pass the course.

Testing Table

Test	No. of Que.	Composition	Points
Test 1	50	MC+FB+MT+CAL	100
Mid-term	50	MC+PR+FB+MT+CAL	100
Test 2	50	MC+FB+MT	100
Lab Report(s)		Essay	100
Assignments		Essay	100
Final	50	MC+PR+FB+MT+CAL	100
Total			600

To pass the lab, students have to score a total of 420 points and pass 8/11 objectives.

Grading Table

Grade	Range of total points	Objectives to be passed
A	540-600	10
B	480-539	9
C	420-479	8
D	360-419	7
F	below 360	below 6

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

LABORATORY POLICIES

All students are expected to arrive for class ON TIME and leave ONLY after the work is completed. A student may not be allowed to attend the lab if he/she arrives late. You must abide by the University's attendance policy.

All students are expected to read each exercise before coming to class. This includes the introduction, procedures and all the terminologies in bold face. You may be tested on these exercises. The students should read and follow the instructions in the lab manual while performing the experiment.

Examinations can be made up only at the end of semester (last week of labs), if an official excuse is presented. Unexcused absences from any examination or laboratory will count as a zero.

LISTED BELOW ARE A FEW RULES TO FOLLOW IN YOUR LABORATORY WORK:

1. Read and follow directions given in your lab manual.
2. Handle all equipments with care.
3. Leave equipments, slides or preserved materials on the lab tables neatly arranged.
4. Discard materials as directed.
5. Do not remove solutions or other materials from demonstration table.
6. Always handle all the chemicals with care.
7. Do not remove items from other students' set up unless you receive permission from the instructor.
8. Always empty and rinse all glassware used during the lab period.
9. No smoking, drinking, gum chewing or eating at any time.
10. Beepers and telephones are not allowed in the lab.
11. Dress properly (No Hats)
12. There will be a severe disciplinary action if any student is caught while cheating or talking during the test.

Detailed Course Objective

The following laboratory exercises are designed to meet the goals of this course. Each objective contains variety of reading/writing exercises, problem solving and scientific reasoning.

Objective 1. Animal Kingdom

Students should be able to:

1. list the characteristics of animals
2. recognize representatives of the phyla Porifera, Cnidaria, Platyelminthes, Nematoda
3. explain the body plan of members of Porifera and Cnidaria
4. identify the members of phylum Porifera and Cnidaria
5. identify the representatives of the phylum Platyhelminthes, Nematoda and Rotifera

Laboratory 15. Sponges, Cnidaria, Flatworms and Roundworms

Experiments:

- | | |
|------------------------------|----------|
| A. Classification of Animals | Lab 15.1 |
| B. Phylum Porifera | Lab 15.2 |
| C. Phylum Cnidarian | Lab 15.3 |
| D. Phylum Platyhelminthes | Lab 15.4 |
| E. Phylum Nematoda | Lab 15.5 |

Video Tape: Expansion of Life

Lab Assignments: Laboratory 15. Sponges, Cnidaria, Flatworms, and Roundworms.

Objective 2: Animal Kingdom II

Students should be able to:

1. define the distinctive features of these phyla
2. identify the members of Chordata and Echinodermata
3. identify the organisms of the phylum vertebrata

Laboratory 16. Mollusks, Annelids and Arthropods

Experiments:

- | | |
|-----------------------------------|----------|
| A. Characteristics of Protostomes | Lab 16.1 |
| B. Mollusks | Lab 16.2 |
| C. Annelids | Lab 16.3 |
| D. Arthropods | Lab 16.4 |

Laboratory 17. Echinoders and Chordates

Experiments:

- | | |
|-------------------------------------|----------|
| A. Characteristics of Deuterostomes | Lab 17.1 |
| B. Echinoderms | Lab 17.2 |
| C. Chordates | Lab 17.3 |
| D. Vertebrates | Lab 17.4 |
| E. Comparative Vertebrate Anatomy | Lab 17.5 |

Lab Assignments: Laboratory 16. Mollusks, Annelids and Arthropods
Laboratory 17. Echinoders and Chordates

Objective 2: Animal Kingdom

Laboratory 15, 16 & 17

Students should be able to:

4. list the characteristics of animals
5. explain the body plan of members of Porifera and Cnidaria
6. identify the members of phylum Porifera and Cnidaria
7. identify the representatives of the phylum Platyhelminthes, Nematoda and Rotifera
8. identify the organisms of the Phylum Arthropoda, Annelida, and Molluska
9. define the distinctive features of these phyla
10. identify the members of Chordata and Echinodermata
11. identify the organisms of the phylum vertebrata

Video Tape: Expansion of Life

Laboratory 15. Sponges, Cnidaria, Flatworms and Roundworms

Experiments:

- | | |
|----------------------|----------|
| F. Evolutionary Tree | Lab 15.1 |
| G. Sponges | Lab 15.2 |
| H. Cnidaria | Lab 15.3 |
| I. Flatworms | Lab 15.4 |
| J. Roundworms | Lab 15.5 |

Laboratory 16. Mollusks, Annelids and Arthropods

Experiments:

E. Characteristics of Protostomes	Lab 16.1
F. Mollusks	Lab 16.2
G. Annelids	Lab 16.3
H. Arthropods	Lab 16.4

Laboratory 17. Echinoders and Chordates**Experiments:**

F. Characteristics of Deuterostomes	Lab 17.1
G. Echinoderms	Lab 17.2
H. Chordates	Lab 17.3
I. Vertebrates	Lab 17.4
J. Comparative Vertebrate Anatomy	Lab 17.5

Lab Assignments: Laboratory 15. Sponges, Cnidaria, Flatworms and Roundworms
Laboratory 16. Mollusks, Annelids and Arthropods
Laboratory 17. Echinoders and Chordates

Objective 3. Animal Organization Laboratory 18

Students should be able to:

1. define the degree of organization in animal structure
2. recognize basic tissues and their common mammalian subtypes
3. explain how the basic tissues are utilized to make organs
4. list systems of mammals and their salient features
5. state the basic plan of mammalian body
6. locate the major organs in a mammal's body

Video tape: Animal cells and tissues

Laboratory 18. Animal Organization**Experiments:**

A. Epithelial Tissues	Lab 18.2
B. Muscular Tissues	Lab 18.3
C. Nervous Tissue	Lab 18.4
D. Connective Tissues	Lab 18.5
E. Organs	Lab 18.6

Lab Assignments: Laboratory 18. Animal Organization

**Objective 4. Basic Mammalian Anatomy I Laboratory 19
(Fetal Pig Anatomy)**

Students should be able to:

1. describe and locate external features of a fetal pig
2. determine the sex of a fetal pig
3. describe the function of umbilical cord
4. identify and list the functions of thoracic and abdominal cavity

Laboratory 19. Basic Mammalian Anatomy I

Experiments:

- | | |
|----------------------------|----------|
| A. External Anatomy | Lab 19.1 |
| B. Oral Cavity and Pharynx | Lab 19.2 |
| C. Thoracic cavity | Lab 19.5 |
| D. Human Anatomy | Lab 19.7 |

Lab Assignment: Laboratory 19. Basic Mammalian Anatomy I

Objective 5. Digestive, Respiratory and Circulatory Systems Labs 19 & 25

Students should be able to:

1. locate the organs of digestive, respiratory, and circulatory systems in the fetal pig
2. describe the functions of the organ systems discussed in this exercise
3. list the significance of systems explained in this exercise
4. explain the importance of digestive, respiratory, and circulatory systems to a living mammal
5. describe the pathways of oxygen and CO₂ into and out of the lungs of a mammal

Laboratory 19. Basic Mammalian Anatomy I**Experiments:**

- | | |
|--|------------------|
| A. Abdominal Incision and Abdominal Cavity | Labs 19.3 & 19.6 |
|--|------------------|

Laboratory 25. Basic Mammalian Anatomy II

Experiments:

- | | |
|---|----------|
| A. Respiratory, Digestive and Circulatory Systems | Lab 25.6 |
|---|----------|

Objective 6. Musculoskeleton System Laboratory 20

Students should be able to:

1. identify the major bones of the human skeleton
2. define terms action, insertion and origin as they apply to skeleton muscles and their tendons
3. distinguish between isometric and isotonic contraction of skeleton muscles
4. provide examples of three classes of levers used in everyday life
5. describe the structure of a typical bone

Laboratory 20: Musculoskeleton System**Experiments:**

- | | |
|--------------------------|----------|
| A. Human Skeleton | Lab 20.1 |
| B. Muscle Fibers | Lab 20.2 |
| C. Anatomy of Muscles | Lab 20.3 |
| D. Physiology of Muscles | Lab 20.4 |

Lab Assignments: Laboratory 20: Musculoskeleton System

Objective 7: Circulatory System**Laboratory 22 & 23**

Students should be able to:

1. describe the functions of different types of blood cells
2. differentiate among an artery, capillary, and vein
3. explain how blood flows through capillaries
4. name the four chambers of the heart and describe the route blood takes through them
5. describe the heart contraction
6. list the skeletal muscle involved in breathing
7. explain how air moves in and out of the lungs during respiration in humans and frogs

Laboratory 22. Circulatory System**Experiments:**

- | | |
|--|----------|
| A. Path of Blood in Adult versus Fetus | Lab 22.1 |
| B. Pulmonary Circuit | Lab 22.2 |
| C. Systemic Circuit | Lab 22.3 |
| D. Blood Vessel Comparison | Lab 22.4 |

Laboratory 23. Features of the Circulatory System**Experiment:**

- | | |
|--------------------|----------|
| A. Mammalian Heart | Lab 23.1 |
| B. Mammalian Blood | Lab 23.2 |
| C. Heartbeat | Lab 23.3 |

Lab Assignment: Laboratory 22. Circulatory System
Laboratory 23. Features of the Circulatory System

**Objective 8. Basic Mammalian Anatomy II
(Urogenital & Reproductive Systems)****Laboratory 25**

Students should be able to:

1. locate the organs of urinary system, and reproductive system
2. describe the organs of urinary system, and reproductive system
3. provide the functions of the organs of the urinary system, and reproductive system
4. explain the importance of the urinary system, and reproductive system to a living mammal
5. name and locate the internal structures of the kidney.

Lab 25. Basic Mammalian Anatomy II**Experiments:**

- | | |
|---|----------|
| A. The Urinary System | Lab 25.1 |
| B. Male Reproductive System | Lab 25.2 |
| C. Female Reproductive System | Lab 25.3 |
| D. Male versus Female Reproductive System | Lab 25.4 |
| E. Anatomy of Testes and Ovary | Lab 25.5 |

Lab Assignment: Lab 25. Basic Mammalian Anatomy II

Objective 9. Nervous System and Senses**Laboratory 24**

Students should be able to:

1. describe the flow of information through the nervous system
2. state the function of sensations
3. explain the stretch reflex
4. describe a pupillary reflex
5. differentiate between a reflex and a reaction

Lab 24. Nervous System and Senses

Experiments:

A. The Mammalian Brain	Lab 24.1
B. The Spinal Cord and Spinal Nerves	Lab 24.2
C. The Human Eye	Lab 24.3
D. The Human Ear	Lab 24.4
E. Receptors in Human Skin	Lab 24.5
F. Human Chemoreceptors	Lab 24.6

Lab Assignment: Lab 24. Nervous System and Senses

Objective 10. Writing Exercises

Writing exercise(s), quizzes, and assignments.

Individual instructors will determine format, frequency, and scoring of writing exercise(s), quizzes and assignments

At the end of each laboratory there are lab assignments. These lab assignments are to be completed after the lab has been taught by your instructor. You will be graded on lab assignments which will contribute to a total of 100 points. Your instructor will determine the number of lab assignments. Following are some ways that can be used by your instructor to grade lab assignments:

You may be required to turn in **Ten (10)** lab assignments each worth 10 points.

Or

You may be required to turn in selective **Five (5)** lab assignments each worth 20 points.

In order to pass this objective you must make 70 points.

Objective 11: Lab report(s)

You are required by your instructors to submit several lab reports during the semester. The composite scores of all reports will be 100 points. Your lab report should consist of following.

1. Title	10%
2. Objective	10%
3. Materials and Methods	20%
4. Results and Discussion	30%
5. Conclusion	15%
6. References	15%

Title: The title should be less than ten well chosen words indicating the subject.

Objective: The objective should tell exactly what is expected to be learned from the experiment.

Materials and Methods: Include a brief description of the procedures, materials and the equipments involved in the experiment.

Results: Present your findings in logical order, what you have found out in your experiment. The result

should summarize the data from experiment. Also explain the reasoning to support your result. The data may be organized in tables, graphs, figures, photographs etc.

Conclusion: Summarize the findings of the experiment and its significance.

References: This section contains all the articles and or any source of information used in the report. The listing should be in the alphabetical order by the last name of the authors. You must cite all the references otherwise it will be considered Plagiarism.

Example: Mullis, Kary. Origin of unusual polymerase chain reaction. 1990. Scientific American.
Vol.....No.....Page.....