ALABAMA STATE UNIVERSITY  
DEPT. OF MATH & SCIENCE  

GENERAL BIOLOGY LABORATORY HONORS (BIO 128) Credit Hour - 01  
Fall/Spring Semester  

Laboratory Manual: Inquiry into Life (Custom Edition for Alabama State University) by Sylvia Mader  

Lab Section __________ Lab Hour & Day __________ Lab Room-SB 205  
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 fieldwork 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 general biology laboratory course conforms to the second part of introductory biology course. This course enables students to learn about different plants, animals, fungi, and protozoans. The laboratory emphasizes study of major systems of animals with a special thrust to mammals. Students in this laboratory course will gain an opportunity to learn an array of vertebral systems viz. skeleton system, muscular system, integumentary system, digestive system, urinary system, reproductive 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 “hands-on” experience based on every day observation in life.  

Course Goals:  
The main goal of this course is to provide students an opportunity to learn about human organ systems. Thus the knowledge gained in this laboratory could be effectively used to improve the life of humans. 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 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*  
1. Introduction to Invertebrates  
2. Invertebrate Coelomates & Vertebrates  
3. Animal Organization  
4. Basic Mammalian Anatomy I-Fetal Pig Anatomy  
5. Musculoskeletal System  
6. Digestive, and Respiratory Systems  
7. Circulatory System  
8. Basic Mammalian Anatomy II  

Corresponding Labs in the Manual  
Laboratory 27  
Laboratory 28 & 29  
Laboratory 11  
Laboratory 13  
Laboratory 18  
Laboratory 12, 13.6 & 15.4  
Laboratory 14 & 15  

BIO 128 LAB 1  
Last updated, July 2011
(Urogenital, & Reproductive Systems) Laboratory 15
9. Nervous System, Senses and Endocrine System Laboratory 17
10. Survey of Human Diseases
11. Laboratory Assignments

*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 including 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 instructors will determine the number of these questions. Each objective will be weighed equally in terms of testing. Students will be tested on the terms discussed in each objective.

Minimum Standard for Passing: To pass the lab, students have to obtain a minimum total of 350 points.

<table>
<thead>
<tr>
<th>Test</th>
<th>No. of Questions</th>
<th>Composition</th>
<th>Points</th>
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<tbody>
<tr>
<td>Test 1</td>
<td>50</td>
<td>MC+FB+MT+CAL</td>
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<tr>
<td>Mid-term</td>
<td>50</td>
<td>MC+PR+FB+MT+CAL</td>
<td>100</td>
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<tr>
<td>Test 3</td>
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<td>MC+FB+MT</td>
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<tr>
<td>Lab Assignments</td>
<td>50</td>
<td>MC+PR+FB+MT+CAL</td>
<td>100</td>
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<tr>
<td>Final</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>50</strong></td>
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Grading Table:

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<th>Range of total points</th>
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<tbody>
<tr>
<td>A</td>
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<tr>
<td>B</td>
<td>400-449</td>
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<td>C</td>
<td>350-399</td>
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<tr>
<td>D</td>
<td>300-349</td>
</tr>
<tr>
<td>F</td>
<td>Below 300</td>
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</tbody>
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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 terminology 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. Attending one of the labs that meets during the week the lab experiment was missed can make up lab experiments. 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 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 equipment with care.
3. Do not remove solutions or other materials from demonstration table.
4. Always handle all the chemicals with care.
5. Always empty and rinse all glassware used and return it to your work place.
6. No smoking, drinking, gum chewing or eating at any time.
7. Beepers and telephones are not allowed in the lab.
8. Dress properly (No Hats).
9. There will be a severe disciplinary action if any student is caught while cheating 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. Understand the Animal Kingdom I**

Students should be able to:
1. list the characteristics of animals
2. recognize representatives of the phyla Porifera, Cnidaria, Platyhelminthes, 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

**Laboratory27. Sponges, Cnidaria, Flatworms and Roundworms**

**Experiments:**
A. Classification of Animals Lab 27.1
B. Phylum Porifera Lab 27.2
C. Phylum Cnidarian Lab 27.3
D. Phylum Platyhelminthes Lab 27.4
E. Phylum Nematoda Lab 27.5

**Video Tape:** Expansion of Life

**Lab Assignments:** Laboratory27. Sponges, Cnidaria, Flatworms, and Roundworms.

**Suggested Web Resources:**

**Objective 2: Understand the 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

**Laboratory28&29. Mollusks, Annelids and Arthropods**

**Experiments:**
A. Characteristics of Protostomes Lab
B. Mollusks Lab28.1
C. Annelids Lab 28.2
D. Arthropods Lab 28.3
Laboratory 28 & 29. Echinoderms and Chordates

Experiments:
A. Characteristics of Deuterostomes Lab 17.1
B. Echinoderms Lab 28.4
C. Chordates Lab 29.1
D. Vertebrates Lab 29.2
E. Comparative Vertebrate Anatomy Lab 29.3

Lab Assignments: Laboratory 28. Mollusks, Annelids and Arthropods
Laboratory 29. Echinoderms and Chordates

Suggested Web Resources:

Objective 3. Understand the 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 11. Animal Organization

Experiments:
A. Epithelial Tissues Lab11.1
B. Muscular Tissues Lab 11.1
C. Nervous Tissue Lab 11.1
D. Connective Tissues Lab 11.1
E. Organs Lab11.2

Lab Assignments: Laboratory 11. Animal Organization

Suggested Web Resources:

Objective 4. Understand the Basic Mammalian Anatomy I (Laboratory 13)
(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 13 . Basic Mammalian Anatomy I

Experiments:
A. External Anatomy Lab 13.1
B. Oral Cavity and Pharynx Lab 13.2
C. Thoracic cavity Lab 13.3
D. Human Anatomy Lab 13.7

Lab Assignment: Laboratory13 . Basic Mammalian Anatomy I

Suggested Web Resources:


Objective 5. Understand the Musculoskeletal System (Laboratory18)

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

Suggested Web Resources:


Laboratory18: Musculoskeleton System

Experiments:
A. Human Skeleton Lab18.2
B. Muscle Fibers Lab 18.4
C. Anatomy of Muscles Lab 18.3
D. Physiology of Muscles Lab 18.3

Lab Assignments: Laboratory18: Musculoskeleton System

Suggested Web Resources:


Objective 6. Understand the Digestive and Respiratory and Systems (Labs12 &15.4)

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, and respiratory systems to a living mammal
Laboratory 25. Basic Mammalian Anatomy II

Experiments:
A. Respiratory, Digestive and Circulatory Systems

Suggested Web Resources:


Objective 7: Understand the Circulatory System (Laboratory 14)

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 skeleton muscle involved in breathing
7. explain how air moves in and out of the lungs during respiration in humans and frogs

Laboratory 14. Circulatory System

Experiments:
A. Path of Blood in Adult versus Fetus Lab 14.1
B. Pulmonary Circuit Lab 14.2
C. Systemic Circuit Lab 14.3
D. Blood Vessel Comparison Lab 14.4

Laboratory 15. Features of the Circulatory System

Experiment:
A. Mammalian Heart Lab 15.4
B. Mammalian Blood Lab 15.4
C. Heartbeat Lab 15.4

Lab Assignment: Laboratory 14. Circulatory System
Laboratory 15.4. Features of the Circulatory System

Suggested Web Resources:

Objective 8. Understand the Basic Mammalian Anatomy II

Understand the Urogenital & Reproductive Systems

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 15. Basic Mammalian Anatomy II

Experiments:
A. The Urinary System Lab 15.1
B. Male Reproductive System Lab 15.2
C. Female Reproductive System Lab 15.3
D. Male versus Female Reproductive System Lab 15.2
E. Anatomy of Testes and Ovary Lab 15.1 & 15.3

Lab Assignment: Lab 15. Basic Mammalian Anatomy II

Suggested Web Resources:


Objective 9. Understand the Nervous System, Senses and Endocrine System

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
6. locate major endocrine glands in humans and fetal pigs
7. state the hormones released by each gland

Lab 17. Nervous System and Senses

Experiments:
A. The Mammalian Brain Lab 17.1
B. The Spinal Cord and Spinal Nerves Lab 17.2
C. The Human Eye Lab 17.3
D. The Human Ear Lab 17.4
E. Receptors in Human Skin Lab 17.5
F. Human Chemoreceptors Lab 17.6

Lab Assignment: Lab 17. Nervous System and Senses

Suggested Web Resources:

Objective 10. To do the Survey of Human Diseases

Students should be able to:
1. Describe major diseases in the U. S. population.
2. state the causes of the diseases
3. explain measures to prevent such diseases
4. describe other methods practiced to overcome these diseases

Topics:

A. Bacterial Diseases
B. Viral Diseases
C. Genetic Diseases
D. Immune system Diseases
E. Nervous system Diseases
F. Heart Diseases
G. Other Diseases

Objective 11. Laboratory assignments (writing Exercises quizzes, and assignments)

Individual instructor 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 your instructor has taught the lab. You will be graded on the assignment that will contribute to a total if 100 points. You must answer 70% of the questions correctly to pass an assignment. Your instructor will determine the number of lab assignments. Following are some of the ways that can be used by your instructor to grade the lab assignments:

You may be required to turn in Ten (10) assignments each worth 10 points
OR
You may be required to turn in Five (5) selective lab assignments each worth 20 points

Objective 12: To prepare and generate lab report(s)

You are required 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.