COURSE OUTLINE

LIFS 3220 Animal Physiology Laboratory (Spring 2017)

Tutorial Sessions:	Wednesday	09:30 – 10:20	Rm #2406
	Thursday	13:00 – 13:50	Rm # 4160 (Teaching Lab.)
Practical Sessions:	Thursday	14:00 – 16:50	Rm # 4160 (Teaching Lab.)

Instructor: Dr. Philip Y. Lam

Course Grading:	**Quizzes**	**12%**
	Laboratory Performance	**12%**
	Laboratory Reports and Assignments	**28%**
	Written Examination	**48%**

YOU ARE REQUIRED TO ATTEND ALL THE LABORATORY SESSIONS AND SUBMIT ALL LAB REPORTS IN ORDER TO COMPLETE THE COURSE.

Laboratory Schedule:

Week	**Date**		**Activity**
	Experiment #1: Cardiovascular Physiology		
1	8 Feb	09:30 – 10:20	Tutorial (All students)
2	9 Feb	13:00 – 13:50	Pre-lab. Introduction (Session A)
2	9 Feb	14:00 – 16:50	Session A
3	16 Feb	13:00 – 13:50	Pre-lab. Introduction (Session B)
3	16 Feb	14:00 – 16:50	Session B
	Experiment #2: Respiratory Physiology		
4	22 Feb	09:30 – 10:20	Tutorial (All students)
4	23 Feb	13:00 – 13:50	Pre-lab. Introduction (Session A)
4	23 Feb	14:00 – 16:50	Session A
5	2 Mar	13:00 – 13:50	Pre-lab. Introduction (Session B)
5	2 Mar	14:00 – 16:50	Session B
	Experiment #3: Reflexes & Reaction Times		
6	8 Mar	09:30 – 10:20	Tutorial (All students)

6	9 Mar	13:00 – 13:50	Pre-lab. Introduction (Session A)
6	9 Mar	14:00 – 16:50	Session A
7	16 Mar	13:00 – 13:50	Pre-lab. Introduction (Session B)
7	16 Mar	14:00 – 16:50	Session B

Experiment #4: Renal Function

8	22 Mar	09:30 – 10:20	Tutorial (All students)
8	23 Mar	13:00 – 13:50	Pre-lab. Introduction (Session A)
8	23 Mar	14:00 – 16:50	Session A
9	30 Mar	13:00 – 13:50	Pre-lab. Introduction (Session B)
9	30 Mar	14:00 – 16:50	Session B

Experiment #5: Muscle Structure and Function

10	5 Apr	09:30 – 10:20	Tutorial (All students)
10	6 Apr	13:00 – 13:50	Pre-lab. Introduction (Session A)
10	6 Apr	14:00 – 16:50	Session A
11	20 Apr	13:00 – 13:50	Pre-lab. Introduction (Session B)
11	20 Apr	14:00 – 16:50	Session B

Experiment #6: Insect Flight

12	26 Apr	09:30 – 10:20	Tutorial (All students)
12	27 Apr	13:00 – 13:50	Pre-lab. Introduction (Session A)
12	27 Apr	13:00 – 16:50	Session A
13	4 May	13:00 – 13:50	Pre-lab. Introduction (Session B)
13	4 May	14:00 – 16:50	Session B

** Date of the **Written Examination** to be announced by the ARRO.

TEACHING TEAM

Laboratory and Tutorial Instructor

Dr. Philip Y. Lam
Email: ylam@ust.hk
Telephone Ext. 8714

Senior Technician:

Mr. Simon CL Lau

Technician:

Mr. Samuel Cheng

Mr. Rickie Leung

INTRODUCTION

I. Overview of the Animal Physiology Laboratory Sessions

Welcome to the Animal Physiology Laboratory course! Physiology is an experimental science and is best studied with accompanying laboratory sessions. In the laboratory portion of this course, you will learn to handle animals and tissues, as well as set-up and use precision equipment to study physiological phenomena.

Modern physiology requires the use of precision equipment, and knowledge of how to use it is necessary for anyone who anticipates a career in experimental biology. However, the most important and powerful pieces of equipment you have at your disposal, are your eyes, your hands and your brain; Learning how to use these in a laboratory environment is what will make you a good (and perhaps even a great) scientist.

You will be a member of a team of 4-5 individuals. It is suggested that specific jobs be assigned during each experiment, and that each member of the team rotates through these jobs during the course of an experiment. For example, for a given experiment one person on the team may be primarily responsible for the surgical or specimen preparation, another for the instrumentation, and a third for the data keeping etc.

It is important that you read the relevant section of this Laboratory Manual BEFORE turning up for a laboratory session. This will help you decide on your respective jobs before you begin the experiment, otherwise you may find yourself running out of time before the experiment is completed.

The successful pursuit of scientific objectives almost always involves good organization and teamwork. So work together as a team. Do not rush into experiments before thinking about what you as a team have to do first.

You will be organized into lab teams at the teaching lab. The numbers in each team will depend on the total number of students who take the course. For LIFS 3220, there may be between 4 to 5 students per team. Each laboratory session will be run twice on consecutive Thursdays. Your group will be allocated to either Session A or Session B. Refer to the Laboratory Schedule which indicates the relevant dates for Sessions A and B.

Before each new experiment, there will be a tutorial for the entire class explaining the background principles of each experiment, the expected results and the guideline for lab report writing. In addition to the tutorial, a pre-lab introduction will be held before the start of each laboratory session to further explain the practical information about the experiment.

You and your team will be assigned to a workstation in the Teaching Laboratory. For each experiment, your workstation will be equipped with the necessary instruments and materials.

One Teaching Assistant (TA) will look after one to two teams in each session. Your TA is there to help you. Be inquisitive. Ask questions. TAs will also evaluate your Laboratory Reports and Laboratory Performance for each experiment.

Your Laboratory Performance in the Animal Physiology Laboratory is an essential component of the Animal Physiology Course. It will count for up to 12% of your overall grade. Apart from the written Laboratory Examination, you will also be continually assessed on the quality of your Laboratory Performance and Reports. Following a Laboratory Session, you will be allowed one week to compile your Laboratory Report. Usually, they will be returned at the next Laboratory Session attended. TAs will grade your Reports, which will count for up to 28% of your overall grade.

Because of the unique nature of doing experiments with living material, a great deal of variability occurs in how much "hard" data is collected from each experiment. The collection of data is NOT the prime objective of the Animal Physiology Laboratory Sessions. The prime objective is to develop your skills as a bench-top scientist.

How you apply yourself in the pursuit of a defined scientific objective (after all, this is what an experiment really is); how you interpret what results you do obtain (even if they are negative ones); and finally, how you report on the experiment undertaken, are the things you will be judged on.

II. Objectives and Course Learning Outcomes of the Animal Physiology Laboratory Sessions

Objectives

This course is aimed to help you to acquire various basic laboratory techniques in physiology, to develop powers of observation and data recording in order to test basic physiological principles. This course also helps you to develop analytical and report writing skills by conducting experiments, and presenting them in a formal laboratory report format. In addition, students will have opportunities to collaborate with others, working in a team in conducting an experiment.

Course Learning Outcomes

Upon completion of this course, students will be able to:

1. Apply various basic laboratory techniques in physiology to handle animals and tissue.
2. Set up and use precision equipment to study physiological phenomena.
3. Critically observe, qualitatively and quantitatively analyze, and apply physiology knowledge to interpret experimental data.
4. Write formal laboratory reports in a scientific paper format.
5. Work and coordinate effectively in a group to accomplish laboratory-based tasks.
6. Operate ethical laboratory practices such as safety and environmental protection.
7. Evaluate and design laboratory experiments, interpret experimental data and write up the results in accordance with appropriate scientific conventions.

III. Course Grading

The grades for this course will be determined as follows:

Assessment Tasks	Contribution to Final Grade (%)	Learning Outcomes to be Assessed
Quizzes	12%	(1), (2), (3) & (7)
Laboratory Performance	12%	(1), (2), (5) & (6)
Laboratory Reports and Assignments	28%	(3), (4) & (7)
Written Examination	48%	(1), (2), (3) & (7)

Attendance

You are required to attend ALL THE LABORATORY SESSIONS in order to complete the course. Proof of legitimate absence must be provided to your instructor and prior permission from your instructor is required to change the laboratory session.

Quizzes

A good practice always is to study the laboratory manual before you come into the laboratory. Good preparation is encouraged and is assessed by quizzes, which are held at the tutorials. The quizzes are on sudden and random basis, and will consist of multiple-choice questions, assessing you on the experimental details and theory of that laboratory session.

Laboratory Performance

During the practical period, you are required to know clearly what you are doing and why you are doing it, in order to accomplish the task(s) efficiently. Good laboratory performance is encouraged and it will be assessed by your Teaching Assistant (TA). The following is a general guideline of the assessment:

- The marks of lab performance are going to the general performance of all the team members during the 6 lab sessions, i.e. 2% per session. The assessment will be focused on the following areas:
  1. Understanding of tasks listed and motivation to accomplish the tasks;
  2. Communication with group members;
  3. Timing of experiments;
  4. Analysis/ interpretation of the results obtained and understanding of problems with experiments, if they arise;
  5. Clean up the bench after the experiment.

**Note: *Punctuality* is very important in the laboratory course, because if you are late, you not only waste your time, but other student's. You will also disturb others when you go into the laboratory after the class begins. Therefore, please arrive at the lab on time. Names of late students will be recorded by TA and marks from laboratory performance will be deducted.