

BLY 129 COURSE COMPACT

Course

Course code: BLY 129
Course title: Practical Biology II (2 Units)
Course status: Compulsory

Course Duration

Two hours per week for 15 weeks (30 hours)

Lecturer(s) Data

Course Coordinator: Dr. Adetunji
Qualifications obtained: BSc., MSc., PhD.
Department: Biological Sciences
College: Science & Engineering
E-mail: adetunji.charles@lmu.edu.ng
Office Location: New college building
Consultation Hours: Monday - Friday

Name of the lecturer: Adejobi Oluwaniyi
Qualifications obtained: BSc., MSc.
Department: Biological Sciences
College: Science & Engineering
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Office Location: Microbiology laboratory.
Consultation Hours: Monday- Friday 3-4pm

Name of the lecturer: Adelani-Akande, T.A. (Mrs.)
Qualifications obtained: BSc., MSc.
Department: Biological Sciences
College: Science & Engineering
E-Mail: afolabi.tabitha@lmu.edu.ng
Office Location: Room A141, 1st College Building.
Consultation Hours: Mondays 2-4pm & Fridays 1 - 2:50pm

Chief Technologist: Mr. Ajibade
Qualifications obtained: MSc
Department: Biological Sciences
College: Science & Engineering
E-Mail: ajibade.matthew@lmu.edu.ng
Office Location: Biochemistry laboratory.
Consultation Hours: Monday - Friday

Course Content –

Collection and preservation of plant specimens including preparation of plant press.
Collection and preservation of animal specimens: Wet/liquid preservation. Taxidermy.
Mounting and exhibition of Biological specimen: Plastic mounting. Basic histologic and histochemical (Slide preparation) Techniques. pH measurement. A survey of common electronic equipment used in biological research.

Course Description –

This course poised to increase the knowledge and skill of students in practical biology. Students are expected to have taken BLY 119- Practical Biology I as a prerequisite for this course. Students will be exposed to apparatus and equipment in our Biology Lab, safety and security measures in the laboratory. They will also be taught how to make plant press as well as methods for collecting plants and animal specimens in the laboratory and preserving them.

Course Justification:

(Ps 11:3) - If the foundation be destroyed, what can the righteous do? This course equips students with basic practical knowledge needed to become frontier scientists.

Course objectives

At the end of this course, students should be able to:

- (i) Mention and identify various apparatus and equipment found in the biology lab, stating the use of each of them.
- (ii) Describe various safety and security measures put in place in the lab and explain how to manage emergency situations in the laboratory.
- (iii) Collect plant and animal specimen successfully and preserve same.
- (iv) Prepare both temporary and permanent slides using histological techniques.
- (v) Undertake taxidermic preparation of animal specimen.
- (vi) Make use of a pH meter and other lab apparatus and also know the basic principles guiding the use of each instrument.

Course Requirement – Illustration below:

To derive maximum benefits from the course and for fast grasping of many of the concepts, the course requires that the students be familiar with BLY 119-Practical Biology I. Failure to attend the practical classes could result into student failing the course.

Method of Grading

S/N	Grading	Score (%)
1	Practical (laboratory work)	70
2	Final Examination	30
	Total	100

Course Delivery Strategies:

The course is basically practical in nature however; students will be shown how to go about each exercise before trying it out.

LECTURE CONTENT

➤ **Week 1:** General introduction

➤ **Objectives**

The students at the end of the lectures for the week should be able to:

- a. Explain the scope of this course.
- b. Mention basic lab etiquettes.
- c. Know the basic requirements for the course.
- d. Define some common terms they will come across in the course.

➤ **Description**

General introduced to the course, linking it with the prerequisite course and adding new concepts to what they already know.

- #### ➤ **Study Question:** Mention 20 does and don'ts in a biology laboratory. Why should they be strictly followed when working in the laboratory?

➤ **Reading List –**

1. Biological safety: principles and practices, 2006. Fleming, D.O and Hunt, D.L. ASM Press.
2. Principles of Biological Techniques, S.O. Owa. 2012. Palace Publication& Press.

➤ **Week 2:** Collection and preservation of plant specimen I

➤ **Objectives**

Students should be able to:

- a. Explain the rudiments of plant collection from the field.
- b. Mention various method and reagents required for preservation of plant specimen.
- c. Describe how to collect plant specimen.

➤ **Description**

Detailed explanation on the processes involved in collection of plant specimen from the field and how to preserve same in the laboratory.

- #### ➤ **Study Question:** Why is it necessary to preserve plant specimens?

➤ **Reading List –**

1. Principles of Biological Techniques, S.O. Owa. 2012. Palace Publication& Press.

➤ **Week 3:** Collection and preservation of plant specimen II

➤ **Objectives**

Students should be able to:

- a. Collect plant specimen from the field with minimum supervision.
- b. Preservation of collected specimen.

c. Prepare a plant press

➤ **Description**

- Field collection of plant specimen and preservation of same in the laboratory.

- **Study Question:** What are some precautionary measures to take when preparing a plant press?

➤ **Reading List –**

1. Principles of Biological Techniques, S.O. Owa. 2012. Palace Publication & Press.

➤ **Week 4:** Collection and preservation of animal specimen I

➤ **Objectives**

Students should be able to:

- a. Explain the basics of collecting animal specimen.
- b. Mention reagents used for preserving animal specimen.
- c. Explain some methods involved in preserving animal specimen.
- d. Describe how to carry out wet/ liquid preservation of animal specimen.

➤ **Description**

- Demonstration of how animal specimen can be collected as well as detailed explanation of procedures involved in collection and preservation of specimen.

- **Study Question:** Mention reagents used to preserve animal specimen; . Why are some reagents not ideal for preserving some types of specimen?

➤ **Reading List –**

1. Principles of Biological Techniques, S.O. Owa. 2012. Palace Publication & Press.

➤ **Week 5:** Collection and preservation of animal specimen II

➤ **Objectives**

Students should be able to:

- a. Collect animal specimen from the field.
- b. Preserve collected specimen.

➤ **Description**

Field collection of animal specimen within the University community and preservation of same in the laboratory.

- **Study Question:** Describe how you will collect lizards from a location in front of your hostel.

➤ **Reading List –**

1. Pulvertaft R.J.V. 1950. Museum Techniques: a review. Journal of Clinical Pathology 3:1-23
2. Principles of Biological Techniques, S.O. Owa. 2012. Palace Publication & Press.

➤ **Week 6: Taxidermy**

➤ **Objectives**

Students should be able to:

- a. Collect and prepare animals to produce them in a life-like form.
- b. Sew experimental animals.

Description

➤ Demonstration of how to preserve animal skin in the laboratory. Guiding students to do the same.

➤ **Study Question:** Why is taxidermy not acceptable to some in recent times? What argument will you give in support of its continuity?

➤ **Reading List –**

1. Rachel Poliquin. 2008. The matter and meaning of museum taxidermy. Museum and society 6(2) 123 -134.
2. Principles of Biological Techniques, S.O. Owa. 2012. Palace Publication& Press.

➤ **Week 7: Mounting and exhibition of biological specimen**

➤ **Objectives**

Students should be able to:

- a. Demonstrate wet/dry mounting.
- b. Describe plastic mounting.
- c. Explain how to carrying out mounting using Perspex.

➤ **Description**

➤ Various methods used in mounting biological specimen will be elaborated and students be engaged in preparing a mount for exhibiton.

➤ **Study Question:** Describe how to mount using perspex

➤ **Reading List –**

1. Lalit Kumar Jain, Hitesh Babel, Neha Vijay. New technique to mount specimen in the formalin filled jar for anatomy museum with almost invisible support. Int J Cur Res Rev 05(12): 45-50.

➤ **Week 8: Mid-Semester Examination**

➤ **Objectives**

Students should be able to:

- a. Show their understanding of topics covered so far in the course

➤ **Description**

Practical as well as alternative to practical questions will be administered to students.

➤ **Study Question:**

Revise previous study questions.

➤ **Reading List –**

All references listed in the past weeks.

➤ **Week 9:** Basic histologic and histo-chemical techniques I

➤ **Objectives**

Students should be able to:

To introduce students to:

- a. Describe how to use the microtome.
- b. Explain the stages involved in the preparation of a temporary slide.
- c. State in a stepwise manner how to prepare a permanent slide.
- d. Distinguish between a temporary and permanent slide.

➤ **Description**

The microtome is specially designed for cutting thin sections which will be used to prepare either permanent or temporary slide of animal and plant specimens. The uses, types, and basic components of a microtome will be discussed. The stages involved in preparation of temporary and permanent slides will also be elaborated.

- **Study Question:** What is a fixative? Give two examples each of temporary and permanent mountant.

➤ **Reading List –**

1. Principles of Biological Techniques, S.O. Owa. 2012. Palace Publication & Press.

➤ **Week 10:** Basic histologic and histo-chemical techniques II

➤ **Objectives**

Students should be able to:

- a. Discuss the essence of staining.
- b. Describe the procedure for staining sections.
- c. Mention common stains used in histology.

➤ **Description**

Staining is an essential step in preparing a microslide but to get a good slide, it must be done following the proper protocol. These steps will be unveiled to students. Stains serve different purposes hence a suitable stain must be chosen for each specimen depending on the features of interest.

- **Study Question:** Why is staining important in histology?

Reading List – Principles of Biological Techniques, S.O. Owa. 2012. Palace Publication & Press.

➤ **Week 11:** Basic histologic and histo-chemical techniques III/
Embalment of mammals

➤ **Objectives**

Students should be able to:

- a. Describe a bone slide preparation.
- b. Elaborate on the uniqueness and uses of a cryostat.
- c. Embalm an animal specimen.

➤ **Description**

- The uniqueness of bone slide preparations will be emphasised. The cryostat will be compared with other types of microtome.

- **Study Question:** What are the basic components of a microtome? How is the cryostat different from other microtomes.

➤ **Reading List –**

1. Principles of Biological Techniques, S.O. Owa. 2012. Palace Publication & Press.

➤ **Week 12: pH measurement I**

➤ **Objectives**

Students should be able to:

- a. Define pH.
- b. Describe various methods of determining the pH of a solution.
- c. Prepare a standard solution of known pH.

➤ **Description**

- Detailed explanation of the concept. Preparation of solutions and demonstration of colorimetric methods of pH determination.

- **Study Question:** Why is pH measurement important to a biologist?

➤ **Reading List –**

1. Gupta, Alka. 2009. Instrumentation and bio-analytical techniques. PragatiPrakashan Publishers.
2. Principles of Biological Techniques, S.O. Owa. 2012. Palace Publication & Press.

➤ **Week 13: pH measurement II**

➤ **Objectives**

Students should be able to:

- a. Mention the components of a pH meter.
- b. Describe how a pH meter functions.
- c. Demonstrate how to calibrate a pH meter.
- d. Take readings of different solutions using a pH meter.

➤ **Description**

The pH meter must be calibrated before use; this is done following a step by step protocol using buffer solution. Ability to use the pH meter is essential for students in the biological sciences, this will be inculcated into students.

- **Study Question:** Why is the pH meter often preferred over other pH measurement techniques? Under what conditions will the pH meter be inappropriate for measuring pH?

➤ **Reading List –**

1. Gupta, Alka. 2009. Instrumentation and bio-analytical techniques. PragatiPrakashan Publishers.
2. Principles of Biological Techniques, S.O. Owa. 2012. Palace Publication & Press.

➤ **Week 14: Revision**

➤ **Objectives**

Students should be able to:

- a. Recollect the principles they have learnt in the course of the semester.
- b. Handle all instruments they used during the semester.
- c. Explain various protocols and define terminologies they came across in this course.
- d. Ask relevant questions on difficult areas.

➤ **Description**

Students will be made revise all topics treated during the semester.

➤ **Study Question:**

All study questions in the past weeks.

➤ **Reading List –**

All references listed in the past weeks.

➤ **Week 15: Examination**

➤ **Objectives**

Students should be able to:

- a. Answer relevant questions relating to topics covered during the semester.

➤ **Description**

The students will be examined to determine their residual knowledge of the course.

➤ **Study Question:**

All study questions in the past weeks.

➤ **Reading List –**

All references listed in the past weeks.