BIO 208 – Histology

COURSE PARTICULARS

Course Code: BIO 208
Course Title: Histology
No. of Units: 2
Course Duration: One hour of theory and three hours of practicals per week for 15 weeks.
Status: Compulsory
Course Email Address: bio208@gmail.com
Prerequisite: NIL

COURSE INSTRUCTORS

Dr O. Fagbuauro
Room 2, Ground Floor, ACADEMIC BUILDING
Dept. of Biology,
Federal University of Technology, Akure, Nigeria.
Phone: +2348034925363
Email: ofagbuauro@futa.edu.ng

and

Mrs. B. O. Odiyi
Room 04, Laboratory I,
Dept. of Biology,
COURSE DESCRIPTION

This course is designed primarily for students in biology (storage technology option) and other biology related disciplines. The course explores the histological processes pertinent to plants and animals. It enhance the knowledge of the students in the classification of plant tissue based on cell type ie simple plant tissue and more complex plant tissues. Also on the animal epithelial tissue types which include the connective tissue types,muscle tissues and the nervous tissues. The practical aspect of the course focuses on the different techniques used in the preparation of temporary and permanent plant tissue sections and also animal histological techniques such as fixation, dehydration, of identification keys. Diagnostic features of insect taxa, insect collection methods, identification and preservation techniques. The understanding of the rationale behind the practical procedures will enhance the student’s ability to design their own procedures if necessary as they advance to higher levels.

COURSE OBJECTIVES

The objectives of this course are to:

- build up the knowledge of the students in the area of plant and animal histology; and
- open up the students to detailed plant and animal histological studies and the use of microscope for viewing sections of tissues.

COURSE LEARNING OUTCOMES / COMPETENCIES

Upon successful completion of this course, the student will be able to:

(Knowledge based)

- state the importance of histological techniques and their applications;
- define the classification of plant tissues based on different cell types;
• list and describe the animal epithelial tissue types including the connective tissue type, the muscle and the nervous tissues;
• list and describe the scope and applications of histochemistry;
• draw the different types of plant tissues using free hand and different kinds of stains used in plant histology;
• Describe the fixation and stains used in animal histology and their chemical composition;
• Know the diagnostic features of insect taxa, their collection methods, identification and their preservation techniques;

(Skills)
  o Use the historical background and present day application of histology;
  o draw the plant tissues on one cell type and more than one cell type
  o use free hand and microtome to cut different part of plants and staining;
  o demonstrate fixatives and stain in animal histology;
  o use the method of preservation techniques for insects;

**GRADING SYSTEM FOR THE COURSE**

This course will be graded as follows:

<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Attendance</td>
<td>10%</td>
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<tr>
<td>Practical Class Report and Activity</td>
<td>20%</td>
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<tr>
<td>Assignments</td>
<td>10%</td>
</tr>
<tr>
<td>Test(s)</td>
<td>20%</td>
</tr>
<tr>
<td>Final Examination</td>
<td>40%</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td>100%</td>
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</table>
GENERAL INSTRUCTIONS

Attendance: It is expected that every student will be in class for lectures and also participate in all practical exercises. Attendance records will be kept and used to determine the qualification to sit for the final examination. In case of illness or other unavoidable cause of absence, the student must communicate as soon as possible with any of the instructors, indicating the reason for the absence.

Academic Integrity: Violations of academic integrity, including dishonesty in assignments, examinations, or other academic performances are prohibited. You are not allowed to make copies of another person’s work and submit it as your own; that is plagiarism. All cases of academic dishonesty will be reported to the University Management for appropriate sanctions in accordance with the guidelines for handling students’ misconduct as spelt out in the Students’ Handbook.

Assignments and Group Work: Students are expected to submit assignments as scheduled. Failure to submit an assignment as at when due will earn such candidate zero for that assignment. Only under extenuating circumstances, for which a student has notified any of the instructors in advance, will late submission of assignments be permitted.

Code of Conduct in Lecture Rooms and Laboratories: Students should turn off their cell phones during lectures. Students are prohibited from engaging in other activities (such as texting, watching videos, etc.) during lectures. Food and drinks are not permitted in the laboratories.

READING LIST


Legend
4- Available as Personal Collection

COURSE OUTLINE
<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>• Introduction and Course Overview</td>
<td>During this first class, the expectation of the students from the course will also be documented.</td>
</tr>
<tr>
<td></td>
<td>• Historical background and present day application of histology</td>
<td></td>
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<tr>
<td>2</td>
<td>• Classification of plant tissue based on cell type</td>
<td>Practical exercise will involve cutting the stem, leaves and root of plants and viewing under the microscope.</td>
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<tr>
<td></td>
<td>• Animal epithelial tissue type</td>
<td></td>
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<tr>
<td>3 &amp; 4</td>
<td>Histochemistry</td>
<td>Practical exercise will involve the Techniques used in the preparation of temporary and permanent plant tissue sections.</td>
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<td>• Importance</td>
<td></td>
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<td></td>
<td>• Scope</td>
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<td></td>
<td>• Applications</td>
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<tr>
<td>5 &amp; 6</td>
<td>Fixatives and stains used in animal histology and their chemical composition</td>
<td>The practical exercises will involve the use of fixatives and stains in animal (preferably a rat) dissection.</td>
</tr>
<tr>
<td>7 &amp; 8</td>
<td>Animal histological techniques such as fixation, dehydration of identification keys</td>
<td>The practical exercise will involve the use of fixatives and stains in animal histology</td>
</tr>
<tr>
<td>9 &amp; 10</td>
<td>Diagnostic features of insect taxa</td>
<td>The practical exercise will involve studying the different features of insects and drawing them.</td>
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<tr>
<td></td>
<td>Insect collection methods</td>
<td>Practicals involve using different methods to collect insects.</td>
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<tr>
<td>11 &amp; 12</td>
<td>Identification of insects</td>
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<td></td>
<td>Preservation techniques</td>
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<tr>
<td>13 &amp; 14</td>
<td>REVISION</td>
<td>This is the week preceding the final examination. At this time, evaluation will be done to assess how far the students’ expectations for the course have been met.</td>
</tr>
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</table>
BIO 302 – SEED PLANTS

Course Code: BIO 302
Course Title: SEED PLANTS
No. of Units: 2
Course Duration: One hour of theory and three hours of practicals per week for 15 weeks.
Status: Compulsory
Course Email Address: bio302@gmail.com
Prerequisite: NIL

COURSE INSTRUCTORS

Mrs. B. O. Odiyi
Room 4, Laboratory 1.
Dept. of Biology,
Federal University of Technology, Akure, Nigeria.
Phone: +2348035639111
Email: boodiyi@futa.edu.ng

and

Mr. A. S. Oyelakin
Room 3, Laboratory 1.
Dept. of Biology,
COURSE DESCRIPTION

This course opens students to the study of the general characteristics, similarities and differences between the Gymnosperms and the Angiosperms. The various groups and orders (living and extinct) of gymnosperms. Studies of examples in each group of the living forms (morphology and reproduction inclusive). General features of the angiosperms, leaf types, root types, stem types and functions. Morphology and anatomy of root, stem, leaves, floral parts and functions. Fruit formation. Taxonomy of some major economic tropical plants.

COURSE OBJECTIVES

The objective of this course is to:
- equip the students with the knowledge of the evolutionary trend from the gymnosperms to the angiosperms which are present day flowering plants.

COURSE LEARNING OUTCOMES / COMPETENCIES

Upon successful completion of this course, the student will be able to:

(Knowledge based)
- identify the different gymnosperms and angiosperms;
- determine the differences and similarities;
- Know the taxonomy of some major economic tropical plants;

(Skills)
- Knowledge of the morphology and anatomy of roots, stems and leaves of plants;
- identification of gymnosperms and angiosperms; and
- knowledge of fruit formation;
GRADING SYSTEM FOR THE COURSE

This course will be graded as follows:

- Class Attendance: 10%
- Practical report and exercises: 20%
- Assignments: 10%
- Test(s): 20%
- Final Examination: 40%

**TOTAL:** 100%

GENERAL INSTRUCTIONS

*Attendance:* It is expected that every student will be in class for lectures and also participate in all practical exercises. Attendance records will be kept and used to determine each person’s qualification to sit for the final examination. In case of illness or other unavoidable cause of absence, the student must communicate as soon as possible with any of the instructors, indicating the reason for the absence.

*Academic Integrity:* Violations of academic integrity, including dishonesty in assignments, examinations, or other academic performances are prohibited. You are not allowed to make copies of another person’s work and submit it as your own; that is plagiarism. All cases of academic dishonesty will be reported to the University Management for appropriate sanctions in accordance with the guidelines for handling students’ misconduct as spelt out in the Students’ Handbook.

*Assignments and Group Work:* Students are expected to submit assignments as scheduled. Failure to submit an assignment will earn the student zero for that assignment. Only under extenuating circumstances, for which a student has notified any of the instructors in advance, will late submission of assignments be permitted.
**Code of Conduct in Lecture Rooms and Laboratories:** Students should turn off their cell phones during lectures. Students are prohibited from engaging in other activities (such as texting, watching videos, etc.) during lectures. Food and drinks are not permitted in the laboratories.

**READING LIST**


**Legend**

1- Available in the University Library
2- Available in Departmental/School Libraries
3- Available on the Internet.
4- Available as Personal Collection
5- Available in local bookshops.
# COURSE OUTLINE

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 &amp; 2</td>
<td>Introduction and Course Overview</td>
<td>During this first class, the expectation of the students from the course will also be documented.</td>
</tr>
<tr>
<td></td>
<td>General characteristics, similarities and differences between the gymnosperms and the Angiosperms.</td>
<td></td>
</tr>
<tr>
<td>3 &amp; 4</td>
<td>The various groups and orders (living and extinct) of gymnosperms</td>
<td>Practical exercise will involve looking at the groups of gymnosperms.</td>
</tr>
<tr>
<td>5 &amp; 6</td>
<td>Studies of examples in each group of the living forms (morphology and reproduction inclusive)</td>
<td>Students should be able to identify the groups of the living forms.</td>
</tr>
<tr>
<td>7 &amp; 8</td>
<td>General features of the angiosperms</td>
<td>Students will be required to study the general features of angiosperms and to draw them.</td>
</tr>
<tr>
<td>9 &amp; 10</td>
<td>Leaf types, root types, stem types and their functions</td>
<td>Students will visit the Botanical garden to study the different leaf types, root and stem types and to make drawings.</td>
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</tbody>
</table>

MID-SEMESTER TEST
<p>| 11 &amp; 12 | Morphology and anatomy of root, stem, leaves, floral parts and functions | Students will carry out anatomical sections of the root, stems and leaves. |</p>
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<tbody>
<tr>
<td><strong>13 &amp; 14</strong></td>
<td><strong>Fruit formation. Taxonomy of some major economic tropical plants.</strong></td>
<td>Students will study the various ways of fruit formation and also be familiar with some major economic tropical plants.</td>
</tr>
<tr>
<td><strong>15</strong></td>
<td><strong>REVISION</strong></td>
<td>This is the week preceding the final examination. At this time, evaluation will be done to assess how far the students’ expectations for the course have been met.</td>
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