THE UNIVERSITY OF THE WEST INDIES, ST. AUGUSTINE
FACULTY OF SCIENCE & TECHNOLOGY
DEPARTMENT OF LIFE SCIENCES
COURSE OUTLINE

COURSE CODE: BIOL 3773
COURSE TITLE: Plant Anatomy
SEMESTER: 1
LEVEL: 3
NO OF CREDITS: 3

PRE-REQUISITES: Either BIOL1262 Living Organisms 1 or BIOL1261 Diversity of Organisms or (BIOL1065 Diversity of Plants and Animals and AGR11012 Microbiology); and either BIOL 2XXX Physiology of Plants or BIOL2761 Plant Physiology

Course Description

The course integrates developmental and functional aspects to explain the internal structure and external form of seed plants. The cells, tissues and organs, as well as their modifications, of representative plants are described. The roles of meristematic activity in primary and secondary growth and in determinate and indeterminate growth patterns are explained. Practical exercises are integrated with lectures as much as possible and emphasis is placed on hands-on specimen preparation and on effective use of the light microscope. The course will be assessed by means of in course theory and practical tests, practical reports, and a final theory exam.

Purpose of the Course/Course Rationale

Knowledge of plant anatomy is fundamental to the study of botany and of plant science in general, and the subject is no longer covered in other courses offered by the Department of Life Sciences

Instructor’s Information

Instructor: Dr. G. F. Barclay
E-mail: Gregor.Barclay@sta.uwi.edu
Office location: Rm 324, Old Wing, Natural Sciences Building
Office hours: 9:00 - 5:00 daily (email for appointment)

Course Content

Topics
1. Meristems and growth patterns: primary and secondary growth
2. Plant architecture and phyllotaxy.
3. Transport tissues: phloem and xylem.
4. Protective tissue layers: epidermis, exodermis, endodermis, and periderm.
5. Support tissues: parenchyma, collenchyma, slerenchyma, and xylem.
7. Root and stem structure and modifications. Organs of perennation.
8. Wood anatomy.
10. Flowers and their modifications.
Practical Exercises

1. Cell types
2. Anatomy of herbaceous stems and roots
3. Leaves
4. Woody stems and anomalous secondary growth
5. Flowers and fruit

Goals/Aims

The aim of this course is to give students a working knowledge of the structure of seed plants.

Learning Outcomes

At the end of this course students ought to be able to:

1. Compare the anatomy of eudicot and monocot plants and the concepts of primary and secondary growth.
2. Distinguish between the different types of phyllotaxy and stem branching
3. Relate the anatomical and morphological features of leaves and their modifications to their functional characteristics.
4. Differentiate the external morphological root zones, root modifications, organs of perennation, pericycle, endodermis, casparian band.
5. Compare secondary growth in storage organs with typical secondary growth.
6. Correlate differences in floral structure with fruit structure, and pollination and seed dispersal strategies
7. Classify the organs, tissues, cell layers, and cell types observed in the practical sessions.
8. Create large well labeled illustrations of plant specimens and classify their tissues based on features observed.

Course Assessment

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<tr>
<th>Component</th>
<th>Final Grade</th>
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<tbody>
<tr>
<td>Skill Final Grade</td>
<td>Description</td>
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<tr>
<td>Final exam</td>
<td>50%</td>
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<tr>
<td>In-course test 1</td>
<td>15%</td>
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<td>In-course test 2</td>
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Practical reports | 10% | Performance and reporting of practical exercises
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Practical Quiz | 10% | Quizzes based on identification of plant tissues during practical

**Teaching Strategies**

Credits: 3  
Lectures: 24 lectures  
Tutorials: 5 x 1 hour tutorials  
Practicals: (5x 3 hr practicals)

Lectures: Lectures, which incorporate some video presentations, will provide valuable synthesis and evaluation of the growing body of available information, update current issues, and prioritize content relevant to course assessment.

- **Practicals:** Fortnightly practicals will provide hands on experience for students to gain skills required for conducting well designed laboratory sampling and experiments; to problem solve and trouble shoot in real-life situations; and to become familiar with Plant Anatomy.
- **Tutorials:** Tutorials will cover course topics in a highly interactive format using a variety of collaborative active learning techniques.
- **myeLearning:** myeLearning, will be used extensively during this course for:
  - communication among students and staff (email, discussions)
  - official posting of important notices (coursework assessment notices, instructions, and in-course results)
  - provision of course details, lecture notes, practical guides, tutorial briefings
  - provision of recommended resource materials and links to resources on specific websites

**Resources**

Many resources are available including:
- Lecture presentations (including learning objectives)
- ‘General Resources’- direct links to videos, web-tools and publications relevant to the course
- Discussion forums

**Essential texts:**


**Class Text:**

*G. F. Barclay. Plants Alive!*

**Online course resource:**

*http://sta.uwi.edu/fst/lifesciences/bl11f/**

**Texts for further reading:**


**COURSE CALENDAR**

<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture</th>
<th>Lab</th>
<th>Tutorial</th>
<th>Deadlines</th>
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<td>1</td>
<td>Course Introduction</td>
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<td>Structure of a typical plant</td>
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<td>Vascular tissues</td>
<td>Cell types</td>
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<td>Support tissues</td>
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<td>Protective tissues</td>
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<td>Practical report</td>
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<td>Root and stem structure</td>
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<td>4</td>
<td>Plant Architecture</td>
<td>Stems and roots</td>
<td>Tutorial 2</td>
<td>Practical quiz</td>
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<td>Phyllotaxy</td>
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<td>5</td>
<td>Leaves 1</td>
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<td>Leaves 2</td>
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<td>6</td>
<td>Review</td>
<td>Leaves</td>
<td>Tutorial 3</td>
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<td><strong>Theory and practical test 1</strong></td>
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<td>Modifications of roots, stems, and leaves 1</td>
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<td>Practical report</td>
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<td>Modifications of roots, stems, and leaves 2</td>
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<td>Secondary growth</td>
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<td>Tutorial 4</td>
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<td>Trees and wood anatomy</td>
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<td>Grasses</td>
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<td>Crop plant anatomy and morphology</td>
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<td>10</td>
<td>Flowers and pollination</td>
<td>Flowers and fruit</td>
<td>Tutorial 5</td>
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<td>Fruit structure and seed dispersal</td>
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<td>Review</td>
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ADDITIONAL INFORMATION:
- Students are reminded that they must attend a minimum of 75% of the practical sessions and tutorials. Failure to do so will result in debarment from the final examination.
- As a general principle, medicals or other excuses may only excuse a student’s presence at an assigned time. Students must still complete the assigned work (make-up lab report or make-up test) in order to obtain the marks for that item of coursework. The student is responsible for liaising with the Course Coordinator or Teaching Assistants to ensure the assigned make-up is completed.
- Students are hereby informed that plagiarism is forbidden and all unsupervised coursework items must be accompanied by a Coursework Accountability Statement in order to be assessed. Specific items may require submission through Turnitin on myeLearning. Refer to ‘University Regulations on Plagiarism’ available from [http://sta.uwi.edu/resources/documents/Exam_Regulations_Plagiarism.pdf](http://sta.uwi.edu/resources/documents/Exam_Regulations_Plagiarism.pdf).

HOW TO STUDY FOR THIS COURSE:
- Attendance is mandatory for lectures, tutorials and practicals. Prior preparation is strongly advised to be able to fully participate in activities and obtain the full value of the sessions.
- Thorough use should be made of the resources provided and students are strongly advised to become familiar with them and start using them from the first week. Regular updates on course progress and materials are also highly recommended and you should be checking into myeLearning on a frequent basis to review materials, assignments and activities.
- Students are encouraged to interact regularly with staff on their projects, even outside of the assigned tutorial times to ensure prompt, satisfactory solution of any problems and to monitor progress.