SYLLABUS

Course Code	*Course Num.*	*Course Name*	*Credit Hours*	*Lec.*	*Lab.*	*Tut.*	*Private study*	*Pre-requisites*	*Course Level*	*Teaching Language*
BIO	**322**	**Plant Anatomy**	**3**	**2**	**2**	**0**	**5**	**BIO 121**	**5**	**English**

A. Course Description

Course description: This course has titles which will introduce the plant cell histology. So, this course involves types of microscopy, basic plant cell histology, basic plant cell types, functional tissue systems, supportive systems, protective systems, absorptive systems, transport systems, photosynthetic systems, and secretory/excretory systems.

B. Course Outcomes

At the end of this course the student will be able to:

1. Describe the relationships between structure and function in plant cells, tissues, and organs.
2. Explain how patterns of development are regulated by genetically determined processes.
3. Appreciate the contributions of modern research methods like genome sequencing, mutation.
4. Analysis, transgenics, and imaging to our understanding plant structure and development.
5. Interpret the results of scientific experiments.
6. Read and understand scientific papers.
7. Compare and contrast vegetative and reproductive anatomy, including leaves, stems roots, flowers, and fruits.
8. Compare and contrast the mechanism of each wind, water and insects pollination.
9. Discuss the economic and social importance of local plants.
10. Understand the morphology and anatomy of plants at the cell, tissue, and organ level.
11. Recognize and be able to describe features of plant anatomy at the cell, tissue and organ level.

C. References

Required Textbook

- *An Introduction to Plant Structure and Development: Plant Anatomy for the Twenty-First Century*, 2nd Edition, ISBN-13: 978-0521518055.
- *Plant Anatomy*, ISBN-13: 978-1932846171.
- *Laboratory Guide to Plant Anatomy*, Twelfth Edition.
- *Integrative Plant Anatomy*, Academic Press.
- *Electronic Plant Anatomy Laboratory Exercises.*

Other references

- *Esau's Plant Anatomy*, 3rd Edition Ray F. Evert (Author),Susan E. Eichorn (Author) A. John Wiley & Sons , Inc., Publication.
- *Teaching Plant Anatomy through Creative Laboratory Exercises*, R. Larry Peterson *et al.*
- *Plant Anatomy*, 4th Edition. Pergamon press, Oxford.

Course Website: www.Sciencedirect.com

D. Topics Outline

D1. Lectures topics

1. ***Microscopy.***
2. ***Introduction to the Class & the "Paperless" Environment History of Plant Anatomy.***
3. ***Types of Microscopy.***
4. ***Digital Microscopy.***
5. ***Basic Plant Cell Histology.***
6. ***Cell contents.***
7. ***Plant extracellular matrix.***
8. ***Basic Plant Cell Types.***
9. ***Apical Meristem; Vascular Cambium; Phellogen.***
10. ***Epidermis; Guard Cells.***
11. ***Parenchyma; Collenchyma.***
12. ***Sclereids; Fibers.***
13. ***Tracheids; Vessel Elements.***
14. ***Sieve Cells; Sieve Tube Elements.***
15. ***Laticifers.***
16. ***Functional Tissue Systems.***

17. ***Supportive Systems.***
18. ***Protective Systems.***
19. ***Absorptive Systems.***
20. ***Transport Systems: Xylem.***
21. ***Transport Systems: Phloem.***
22. ***Transfer Cells.***
23. ***Analysis of plant genes.***
24. ***Photosynthetic Systems.***
25. ***C3, C4 and CAM Plants.***
26. ***Storage Systems Water and Elaborated Reserves.***
27. ***Secretory/Excretory Systems - Hydathodes.***
28. ***Secretory/Excretory Systems - Stinging Hairs and Glandular Trichomes.***
29. ***Secretory/Excretory Systems - Ducts and Laticifers.***
30. ***A general revision of what has been studied and responded to queries.***

D2. Laboratories topics

1. ***The Microscope and Plant Cell Structure:*** *General Anatomy and Morphology.*
2. ***Cell Types and Tissues:*** *Hand Sectioning and Histology of Cell Contents.*
3. ***Xylem, Phloem, Vascular architecture.***
4. ***Primary roots, primary stems.***
5. ***Primary root and stem development.***
6. ***Secondary growth.***
7. ***Wood anatomy, leaves.***
8. ***Trichomes, Secretory Structures, and Idioblasts.***
9. ***Reproductive Structures and Life Cycle.***
10. ***Seeds and Seedlings.***
11. ***Fruits.***
12. ***General revision.***

E. Office Hours

Office hours give students the opportunity to ask in-depth questions and to explore points of confusion or interest that cannot be fully addressed in class.

F. Exams & Grading System

The semi-official dates of the exams for this course are:

- **Midterm 1:** 6th or 7th week.
- **Midterm 2:** 11th or 12th week.
- **Final Exam Lab:** 16th week.
- **Quizzes & Homeworks:** During the semester.
- **Final Exam:** 16th week.

Your course grade will be based on your semester work as follows:

Midterm 1: 15 %	**Midterm 2: 15 %**	**Final lab. Exam: 20%**	**Final Exam: 40 %**
Quizzes, Homework, Attendance & Participation: 10 %			

The grading distribution:

A+	A	B+	B	C+	C	D+	D	F
[95, 100]	[90, 95)	[85, 90)	[80, 85)	[75, 80)	[70, 75)	[65, 70)	[60, 65)	[0, 60)

G. Student Workload

#	Teaching/Learning activities	Contact hours	Frequency	Total contact hours	Self-study hours	Total self-study hours	Student learning time
5	Lecture	2	15	30	2	30	60
2	Tutorial	0	0	0	0	0	0
0	Lab\practical	2	15	30	1	15	45
5	Homework	0	4	0	2	8	8
4	Quiz	0.5	2	1	1	2	3
6	Midterm	1.5	2	3	5	10	13
7	Final Exam	2	1	2	12	12	14
Total				66		77	143

H. Student Attendance/Absence

Only three situations will be considered as possible excused absences:

- Occurrence of a birth or death in the immediate family will be excused. ("Immediate family" is defined by the University as spouse, grandparents, parents, brother, or sister).
- Severe illness in which a student is under the care of a doctor and physically unable to attend class will be excused. Students are not excused for a doctor's appointment. Do not make appointments that conflict with rehearsals. Notes from the University Health Center will be accepted.

Executive Rules for Study Regulations and Exams

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