

# CBT 230 Plant Anatomy and Embryology

Credit: 2+1

Total Classes: 36 (Theory 24+ Practical 12)

Course Instructor

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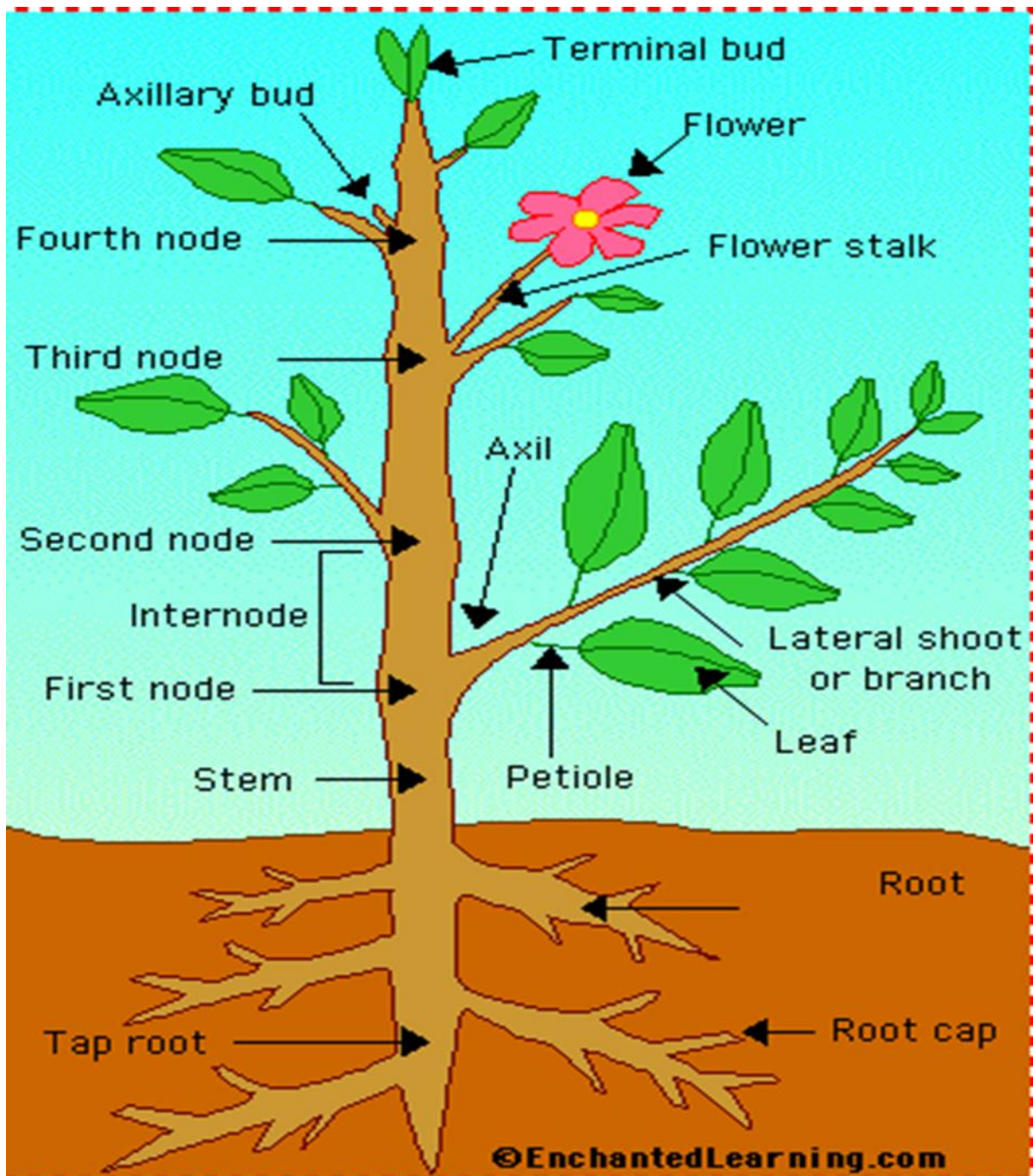
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# Summary of the course

Plant Anatomy & Embryology course deals with the study of gross internal structures of different plant organs namely roots, stem, leaves and the reproductive parts. It focuses on the tissue and tissue systems, normal and anomalous secondary growth of dicots. The processes of micro and mega gametogenesis, fertilization and post fertilizations consequence of floral parts, and endosperm and embryo development of both monocot and dicots are also discussed. These avenues are covered in class lectures and discussions, microscopic laboratory exercises, and report presentations



# What is Plant Anatomy?

- ✓ Plant Anatomy is the general term for the study of the internal structure of plants.
- ✓ Study of gross internal structure of plant
- ✓ Plant anatomy is one of the oldest fields of botany, having been initiated by Nehemiah Grew and Marcello Malpighi in 1671.
- ✓ Plant anatomy is the study of the physical structure of plants
- ✓ It is also known as phytoanatomy, with a practitioner of this scientific discipline being known as a phytoanatomist.
- ✓ Plant Anatomy is also known as Plant Micromorphology

# Objectives of the course

- ✓ To understand the internal structures i.e. micromorphology along with their tissue and tissue systems, primary and secondary growth of tissue in the crop plants,
- ✓ To get a comprehensive idea on the embryogenesis and its practical implications

# Course Learning Outcomes

- By the end of the course, you will be able to-

<b>CLO 1</b>	<b>Understand the tissue with their types and functions</b>
<b>CLO 2</b>	Understand the arrangements vis-à-vis tissue system of different organs of crop plants
<b>CLO 3</b>	Description of the primary and secondary growth plant tissue.
<b>CLO 4</b>	Learn the micro and mega-gametogenesis
<b>CLO 5</b>	Understand fertilization and its consequences
<b>CLO 6</b>	Understand the embryo development of both monocot and dicots plants
<b>CLO 7</b>	Learn practical implication of apomixes and somatic embryogenesis.

Lecture #	Topic
1	Importance of Plant Anatomy in Agriculture
2	Thickening of cell wall
3	Concept, origin and types of meristems
4	Theories of meristem organization
6	Simple tissue
7	Complex tissue
8	Secretory tissue
9	Tissue system
10	1 <sup>st</sup> MIDTERM EXAM.
11	Cambium
12	Stele
13	Anatomy of root
14	Anatomy of stem
15	Anatomy of leaf
16	Secondary growth
17	2 <sup>nd</sup> MIDTERM EXAM.

Lecture #	Topic
17	2 <sup>nd</sup> MIDTERM EXAM.
18	Concept and importance of embryology
19	Microgametogenesis
20	Megagametogenesis
21	Fertilization and development of embryo
22	Development of endosperm
23	Apomixis and Polyembryony
24	Review of the course



## Practical

Lecture #	Topic
1	Introductory and preparation of class
2	Anatomy of roots of a monocot crop
3	Anatomy of roots of a dicot crop
4	Anatomy of stem of a monocot crop
5	Anatomy of stem of a dicot crop
6	Anatomy of leaf of a monocot crop
7	Anatomy of leaf of a dicot crop
8	Kranz Anatomy
9	Observation of Microspore
10	Observation of ovule

# Assessment of Course

Item	Marks/Points
Quiz: Three quizzes will be taken	10
1 <sup>st</sup> Midterm exam	25
2 <sup>nd</sup> Midterm exam	25
Final	40
<b>Total (Theory)</b>	<b>100</b>
<b>Practical</b>	
Class performance	
Note Book	
Assignment	
Final Exam	
<b>Total Practical</b>	<b>50</b>
<b>Total</b>	<b>150</b>

# Grading System

Grade	% Marks	GP
A+	80% and above	4.0
A	75-79%	3.75
A-	70-74.9%	3.5
B+	65-69.9 %	3.25
B	60-64.9 %	3.0
B-	55-59.9 %	2.75
C+	50-54.9%	2.5
C	45-49.9 %	2.25
D	40-44.9 %	2.0
F	Bellow 40%	0

## References

- ✓ Anatomy of seed plants by Katherine Esau
- ✓ Plant Anatomy by BP Pandey
- ✓ Embryology of angiosperm by PN Maheswary

# Importance of Plant Anatomy in Agriculture

- ✓ Plant physiological study
- ✓ Plant Nutritional study
- ✓ Agronomy
- ✓ Crop improvement
- ✓ Plant pathology
- ✓ Entomology
- ✓ Biotechnology

- Structural and functional organization
- To understand the conduction path of water and mineral nutrients
- Translocation of assimilates into different plant parts
- Plant metabolic activity
- Plant development and storage of food
- Wood structure and industrial activity
- Plant protection against pests
- Discovering new plant species

What we learned?