



# Course Specifications

<b>Course Title:</b>	Plant Morphology and Anatomy
<b>Course Code:</b>	231 Bio-3
<b>Program:</b>	Biology
<b>Department:</b>	Biology
<b>College:</b>	Sciences and Art College
<b>Institution:</b>	Najran University

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## A. Course Identification

<b>1. Credit hours:</b> 3 (2+1)
<b>2. Course type</b>
a. University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b. Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
<b>3. Level/year at which this course is offered:</b> level 5 / third year
<b>4. Pre-requisites for this course (if any):</b> 101Bio-4
<b>5. Co-requisites for this course (if any):</b>

### 6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	30+30	100%
2	Blended		
3	E-learning		
4	Correspondence		
5	Other		

### 7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
<b>Contact Hours</b>		
1	Lecture	15
2	Laboratory/Studio	30
3	Tutorial	
4	Others (specify)	-
	<b>Total</b>	45
<b>Other Learning Hours*</b>		
1	Study	27
2	Assignments	3
3	Library	10
4	Projects/Research Essays/Theses	5
5	Others(specify): Office hours	10
	<b>Total</b>	55

\*The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

## B. Course Objectives and Learning Outcomes

### 1. Course Description

This course will build on the topics covered the general concepts behind the anatomy and morphology of plants. These concepts will be discussed at different levels, from the (sub)cellular to the ecosystem level. The structure of vascular plants from the level of single cell to the level of whole organism will be presented. The students will attain knowledge of the structure of plant organism from cell to the whole organism level and the mechanisms of plant multiplication and life cycle. analyze the differences between monocot & dicot stem and also between monocot& dicot root at morphological and anatomic scale. The skills in specimen preparation for microscopic observation, light microscopy will be attained in the practical training.

### 2. Course Main Objective

In this course, you will develop the following specific competencies:

- Knowledge of plant structures and experience in methods dealing with those structures
- Knowledge of sexual and asexual plant reproduction and experience in plant propagation
- Knowledge of the microscopic structure of plant cells and tissues and understanding of how these relate to macroscopic structure and function of organs and whole plants
- Ability to apply the acquired knowledge and skills in the field of plant morphology and anatomy
- Ability to utilize plant morphology and anatomy skills in other related courses and disciplines
- Describe and give examples of the practical use of plant anatomy in wood technology, archaeology, forensics, and paleontology.
- Morphologic studies of plants: structure and varieties in Roots, stems, leaves, flowers, fruits and seeds in dicotyledonous and monocotyledonous. Anatomic studies of plant organs: tissues in roots, stems and leaves at monocotyledonous and dicotyledonous plants.

### 3. Course Learning Outcomes

CLOs		Aligned PLOs
<b>1</b>	<b>Knowledge:</b>	
1.1	Ability to apply the acquired knowledge and skills in the field of plant morphology and anatomy	
1.2	Ability to utilize plant anatomy and morphology in other courses and in praxis	
1.3	Gaining experience with methods dealing with plant structures	
1...	Knowledge of the structure of plants from cells and tissues to organs	
<b>2</b>	<b>Skills : Cognitive</b>	
2.1	Ability to analyse and synthesize	
2.2	Ability to communicate with professionals in different field of study	
2.3	Ability to create new ideas (creativity)	
2...	Science and research skills	
<b>3</b>	<b>Competence: interpersonal Communication Psychomotor</b>	
3.1	Work effectively in groups on laboratory experiments and thoughtful discussion and interpretation of data.	
3.2	Operate effectively the different informational resources including the library resources and websites	

CLOs		Aligned PLOs
3.3	Knowledge of rules of generative and vegetative plant multiplication	
3...		

### C. Course Content

No	List of Topics	Contact Hours
1	<b>Introduction:</b> Basic terminology, major parts of plants	2
2	<b>Plant cell:</b> Classification of cell - prokaryotic, eukaryotic - animal, plant, fungus cell Parts, membranes, organelles Cytoskeleton, cytoplasm, inclusions Plant Cell Walls	4
3	<b>Plant Cell Division.</b> <b>Plant Tissues:</b> Meristems, dermis, gas exchange Absorption, conduction, excretion Photosynthesis, storage, support	4
4	<b>Roots:</b> Primary & secondary structures, morphology Branching, root systems, metamorphosis	2
5	<b>First midterm Exam</b>	1
6	Stems : Primary & secondary structures	2
7	Leaves & Buds : metamorphosis, modifications, abscission	2
8	<b>Flowers:</b> Anatomy, structure, morphology Stamen, pistils, inflorescences Asexual Reproduction Pollination & Fertilization	4
9	<b>Seeds</b>	2
10	<b>Fruits:</b> Structure, development Classification, dispersal	2
11	<b>Second midterm Exam</b>	1
12	Primary Plant Body (Growth) - Anatomy of Monocot and Dicot Root - Anatomy of Monocot and Dicot Stem - Anatomy of Monocot and Dicot leaf	4
13	Secondary Growth : Types of Secondary Growth	2
<b>Total</b>		15

No	List of Topics (Practical)	Contact Hours
<b>Practical topics</b>		
1	General introduction to Botany, plant morphology and plant anatomy	2
2	Seed and seed germination	2
3	The buds and leaves: morphological structures and diversity	2
4	The stem and the roots: morphological structures and diversity	4
5	Flowers and inflorescences	2
6	The fruits	2

7	Introduction to plant anatomy: plant cell and tissues (simple, complexes and secretory tissues)	2
8	Primary Plant Body (Growth) - Anatomy of Monocot and Dicot Root - Anatomy of Monocot and Dicot Stem - Anatomy of Monocot and Dicot leaf	4
9	Types of stele (Stellar system) : Protosteles and Siphonosteles	2
10	Anatomical Structures for Flower, Fruits and Seeds	2
11	Secondary Growth: The Periderm	2
12	Secondary Growth: Types of Secondary Growth	2
13	Anatomical Adaptations (Ecological Anatomy)	2
<b>Total</b>		30

## D. Teaching and Assessment

### 1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1	<b>Knowledge:</b>		
1.1	List knowledge in different organization stage and part of plant: root, stem, leaf, flower, fruit and seed.	Theoretical & lab exams (Mid + Quizzes+ final exam) and lab reports	Theoretical Exam – Practical Exam- capability to use microscope and lenscounting- dissection and identifying plant organs
1.2	Recognize core knowledge of plant tissues and its applications to identify anatomic structure of root, stem and leaf (monocotyledonous and dicotyledonous).	Theoretical & lab exams (Mid + Quizzes+ final exam) and lab reports	Theoretical Exam – Practical Exam- capability to use microscope and lenscounting- dissection and identifying plant organs
1.3			
2	<b>Skills :Cognitive</b>		
2.1	Analyze and compare pictures of plant organ and organ section in monocots and dicots species.	Exams, quizzes, Homework oral question and exams, Tutorial discussion, interpretation of videos / pictures and slides	Exams – discussion laboratory reports
2.2	Tackle sufficient practical skills appropriate to the discipline under study to ensure competence.	Individual and group reports, open class discussion.	laboratory performance and reports

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
<b>3</b>	<b>Competence: interpersonal Communication Psychomotor</b>		
3.1	Employ the internet and electronic databases as a source of information and a mean of communication.	Quizzes, Homework & group reports, oral discussions.	Research reports - presentations
3.2	Perform laboratory work with the ability to adapt to unexpected results, and design new strategies to solve the problems.	Oral presentation, homework reports, videos/ pictures /slides with questions and responses.	Practical exam
...	Illustrate microscopic samples, anatomical and morphological features correctly and accurately	Lab Exam, oral presentation, slide identification	Practical exam

## 2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quizzes, Class activities including (participation in open discussions, speech, oral presentations, group reports, essays) and attendance.	continuous	10%
2	Major exam (multiple choice- short assay- labeling – drawing- memorizing – discussion- solving problems).	5 <sup>th</sup> week	15%
3	Laboratory activities (log book- student work - working in groups).	continuous	5%
4	Practical mid exam (examining slides- interpretation – diagramming).	6 <sup>th</sup> week	10%
5	Final practical exam (examining slides- interpretation – diagramming).	14 <sup>th</sup> week	15%
6	Final exam (multiple choice- short assay- labeling – drawing- memorizing – discussion- solving problems).	15-16 <sup>th</sup> week	45%

\*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

## E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

- Six office hours per week are offered to support students individually.
- Reachable via email.
- Personal web pages of academic members staff in university website.

## F. Learning Resources and Facilities

## 1. Learning Resources

<b>Required Textbooks</b>	<ol style="list-style-type: none"> <li>1. <b>Class Book of Botany Oxford</b> press) A.C.Dutta–(2000).</li> <li>2. Bell, A. D. and Bryan, A. 2008. Plant Form: An Illustrated Guide to Flowering Plant Morphology. 432 pp. ISBN: 088192850X.</li> <li>3. Castner, J. L. 2005. Photographic Atlas of Botany &amp; Guide to Plant Identification. 310 pp. ISBN: 0962515000.</li> </ol>
<b>Essential References Materials</b>	Bell, A. D. and Bryan, A. 2008. Plant Form: An Illustrated Guide to Flowering Plant Morphology. 432 pp. ISBN: 088192850X
<b>Electronic Materials</b>	<ol style="list-style-type: none"> <li>1. <a href="http://users.rcn.Com/jkimball.ma.ultranet/BiologyPages/P/PlantTissues.html">http://users.rcn.Com/jkimball.ma.ultranet/BiologyPages/P/PlantTissues.html</a></li> <li>2. <a href="https://uoh.blackboard.com">https://uoh.blackboard.com</a></li> <li>3. <a href="http://www.google.com">www.google.com</a></li> <li>4. <a href="http://plantdiversityofsaudi-arabia.info/biodiversity-saudi-arabia/flora/Flora.htm">http://plantdiversityofsaudi-arabia.info/biodiversity-saudi-arabia/flora/Flora.htm</a></li> </ol>
<b>Other Learning Materials</b>	Lab. Notes: Will be distributed to the students by the lecturer

## 2. Facilities Required

Item	Resources
<b>Accommodation</b> (Classrooms, laboratories, demonstration rooms/labs, etc.)	Lecture room ( 8 x 15m ) equipped with about 20 student seats, Lab. ( 8 x 15 m) equipped with about 20 student seats.
<b>Technology Resources</b> (AV, data show, Smart Board, software, etc.)	White Board, computer, Data Show, Overhead projector and laptop.
<b>Other Resources</b> (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Library, and Seminar Room and Wi-Fi internet connections Well-equipped laboratory with dissecting microscopes and stereo microscopes. - Permanent slides - Slides and covers - Fresh specimens - Preserved specimens - Chemical reagents

## G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Feedback on effectiveness of teaching	Students	Indirect (by questionnaire)
Extent of achievement of course learning outcomes	Course coordinator	Direct
Quality of learning resources	Internal Audit Committee	Indirect (by questionnaire)



**Evaluation areas** (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

**Evaluators** (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

**Assessment Methods** (Direct, Indirect)

## H. Specification Approval Data

<b>Council / Committee</b>	Internal Audit Committee
<b>Reference No.</b>	
<b>Date</b>	