

CLASS: BSc First Year
 COURSE: Biodiversity: (Microbes, Algae, Fungi and Archegoniate) (BOTA 101)
 LECTURES PER WEEK: 3

Course Outcomes (CO):

After the completion of this course students will be able to

- Know broadly about Plant Kingdom, their occurrence, life cycles and positive and negative effects on our lives.
- Appreciate Invisible life under Kingdom Monera impacting mankind.

S. No.	TOPIC	WEEK	MONTH
1	Plant biodiversity: Microbes: Bacteria, structure and reproduction	1 st	JULY
2	Viruses: Structure, types and reproduction.	2 nd	
3	Algae: An introduction, range of thallus, reproduction	3 rd	
4	Structure and reproduction in <i>Oedogonium</i>	4 th	
5	Structure and Reproduction of <i>Vaucheria</i> , <i>Ectocarpus</i>	1 st	AUGUST
6	Structure and Reproduction of <i>Polysiphonia</i>	2 nd	
7	Economic importance of Algae, Introduction to Fungi	3 rd	
8	Sexual Reproduction in Fungi, Structure and Reproduction of <i>Rhizopus</i>	4 th	
9	Structure and Reproduction of <i>Phytophthora</i> and <i>Penicillium</i>	1 st	SEPTEMBER
10	Structure and Reproduction of <i>Puccinia</i>	2 nd	
11	Structure and Reproduction of <i>Venturia</i> and <i>Agaricus</i>	3 rd	
12	Structure and Reproduction of Lichens	4 th	
13	Economic Importance of Fungi	1 st	OCTOBER
14.	Introduction to Bryophyta	2 nd	
15	Structure and Reproduction of <i>Marchantia</i>	3 rd	
16.	Structure and Reproduction of Funaria.	4 th	
17	Class test on Bacteria, Viruses, Algae, Fungi and Bryopopytes and Doubt solutions, Discussions	1 st	NOVEMBER
18	Introduction to Pteridophyta	2 nd	
19.	Structure and Reproduction of <i>Selaginella</i>	3 rd	
20	Structure and Reproduction of <i>Equisetum</i>	4 th	
21.	Structure and Reproduction of <i>Adiantum</i>	1 st	DECEMBER
22	Economic Importance of Pteridophytes	2 nd	
23	Stelar Evolution	3 rd	
24	Class test on Pteridophytes and Doubt sessions	4 th	
25	WINTER BREAK	1 st	JANUARY
		2 nd	
		3 rd	
		4 th	
		1 st	FEBRUARY
26	Class test and Doubt solutions	2 nd	
27	Introduction to Gymnosperms	3 rd	
28	Structure and Reproduction of <i>Cycus</i>	4 th	
29	Structure and Reproduction of <i>Pinus</i>	1 st	MARCH
30	Economic Importance of Gymnosperms	2 nd	
31	REVISION	3 rd	
32	REVISION	4 th	

CLASS: BSc First Year
 COURSE: Plant Ecology and Taxonomy (BOTA 102)
 LECTURES PER WEEK: 3

Course Outcomes (CO):

After the completion of this course students will be able to

- Grasp knowledge of ecological factors responsible for sustaining plants.
- Get information of different types of ecosystems, their structure and functions.
- Get basic knowledge of nomenclature of Angiosperms

S No	TOPIC	WEEK	MONTH
1	Introduction to Ecology	1 st	JULY
2	Soil: Formation, Composition, Soil Profile	2 nd	
3	States of water in environment, precipitation types	3 rd	
4	Ecological factor: Light	4 th	
5	Ecological factor: Temperature	1 st	AUGUST
6	General account of Adaptations in Xerophytes	2 nd	
7	General account of Adaptations in Hydrophytes	3 rd	
8	Class test, Doubt solutions and Discussion sessions	4 th	
9	Ecotone and Edge effect, Succession; Hydrosere and Xerosere	1 st	SEPTEMBER
10	Succession: Process and types	2 nd	
11	Hydrosere	3 rd	
12	Xerosere	4 th	
13	Ecosystem: Structure and Function	1 st	OCTOBER
14	Energy flow trophic organization, Food chains and food webs	2 nd	
15	Ecological Pyramids	3 rd	
16	Class test and doubt solving sessions, Discussions	4 th	
17	Introduction to Plant Taxonomy	1 st	NOVEMBER
18	Functions of Herbarium, Important herbaria	2 nd	
19	Botanical gardens of World and India	3 rd	
20	Taxonomic evidences from Cytology	4 th	
21	Taxonomic evidences from Palyntology, Phytochemistry and Molecular data	1 st	DECEMBER
22	Taxonomic hierarchy		
23	Botanical Nomenclature	2 nd	
24	Principals and rules (ICN), ranks and names	3 rd	
25	Binomial system, valid publication, Principals of priority and its limitations	4 th	
26	WINTER BREAK	1 st	January
		2 nd	
		3 rd	
		4 th	
		1 st	FEBRUARY
27	Class test, Doubt sessions and discussions	2 nd	
28	Classification, Artificial, natural and phylogenetic	3 rd	
29	Bentham and Hooker, Engler and Prantal	4 th	

30	Biometrics, Numerical Taxonomy and Cladistics	1 st	MARCH
31	REVISION	2 nd	
32	REVISION	3 rd	
33	REVISION	4 th	

CLASS: BSc Second Year
 COURSE: Plant Anatomy and Embryology (BOTA 201)
 LECTURES PER WEEK: 3

Course Outcomes (CO):

After the completion of this course students will

- Learn about different types of tissues in plants, internal structure of plant organs and their anomalous growth.
- Learn about different parts in a flower, phenomenon of spore and Egg formation,
- Interesting phenomenon of pollination
- Fruit and seed formation in Angiosperms

S No	TOPIC	WEEK	MONTH
1	Tissues and the tissue system	1 st	JULY
2	Apical Meristem: Root and Shoot	2 nd	
3	Apical Meristem: Root and Shoot (Contd.)	3 rd	
4	Primary structure of root	4 th	
5	Primary structure of stem and leaf	1 st	AUGUST
6	Vascular cambium and periderm	2 nd	
7	Secondary growth in roots	3 rd	
8	Secondary growth in stem	4 th	
9	Anomalous growth in roots	1 st	SEPTEMBER
10	Anomalous growth in stem	2 nd	
11	Adaptations in Hydrophytes	3 rd	
12	Adaptations in Hydrophytes (Contd.)	4 th	
13	Adaptations in Xerophytes (Contd.)	1 st	OCTOBER
14.	Class test, doubt session and discussions	2 nd	
15	Structure of flower and description	3 rd	
16.	Inflorescence and its type	4 th	
17	Microsporogenesis and male gametophyte	1 st	NOVEMBER
18	Megasporogenesis and female gametophyte	2 nd	
19.	Class test, doubt session and discussions	3 rd	
20	Pollination, cross pollination and adaptations	4 th	
21.	Agencies of cross pollination	1 st	DECEMBER
22	Fertilization and post fertilization changes	2 nd	
23	Fertilization and post fertilization changes (Contd.)	3 rd	
24	Class test, doubt session and discussions	4 th	
25	WINTER VACATIONS	1 st	JANUARY
		2 nd	
		3 rd	
		4 th	
		1 st	FEBRUARY
26	Class test and Doubt solutions	2 nd	

27	Endosperm in Angiosperms	3 rd	MARCH
28	Embryo development in dicots and monocots	4 th	
29	Fruit and seed development	1 st	
30	Dispersal of fruits and seeds	2 nd	
31	REVISION	3 rd	
32	REVISION	4 th	

CLASS: BSc Second Year
 COURSE: Plant Physiology and Metabolism (BOTA 202)
 LECTURES PER WEEK: 3

Course Outcomes (CO):

After the completion of this course students will

- Get knowledge of Respiration, Photosynthesis, Transpiration, Nutrition in plants
- Appreciate how plants prepare nitrogen in their system in order to give nitrogen in food for all living beings.
- Role of hormones in flowering of plants

S No	TOPIC	WEEK	MONTH
1	Ascent of sap and Transpiration	1 st	JULY
2	Mineral Nutrition	2 nd	
3	Absorption and transportation of solutes, translocation of organic solutes	3 rd	
4	Cellular enzymes	4 th	
5	Photosynthesis	1 st	AUGUST
6	Photosynthesis (Contd.)	2 nd	
7	Respiration	3 rd	
8	Respiration (Contd.)	4 th	
9	Class test and Doubt solutions	1 st	SEPTEMBER
10	Nitrogen metabolism	2 nd	
11	Growth and growth hormones	3 rd	
12	Growth Hormones (Contd.)	4 th	
13	Photoperiodism	1 st	OCTOBER
14.	Vernalisation	2 nd	
15	Class test, doubt session and discussions	3 rd	
16.	Photomorphogenesis	4 th	
17	Dormancy	1 st	NOVEMBER
18	Germination of seeds	2 nd	
19.	Ageing, senescence and death	3 rd	
20	Plant movements	4 th	
21.	Properties of Solutions, suspensions and colloidal solutions	1 st	DECEMBER
22	Class test, doubt session and discussions	2 nd	
23	Permeability, Imbibition, Osmosis, diffusion and osmotic systems	3 rd	
24	Absorption and transport of water	4 th	
25	WINTER VACATIONS	1 st	JANUARY
		2 nd	
		3 rd	
		4 th	
		1 st	

26	Class test and Doubt solutions	2 nd	FEBRUARY
27	Absorption of water and transpiration	3 rd	
28	Rapid learning of Photosynthesis	4 th	
29	Rapid learning of Respiration	1 st	MARCH
30	REVISION	2 nd	
31	REVISION	3 rd	
32	REVISION	4 th	

CLASS: BSc Third Year
 COURSE: Economic Botany and Biotechnology (BOTA 301)
 LECTURES PER WEEK: 3

Course Outcomes (CO):

After the completion of this course students will be able to know

- About cultivation of crops, cereals, pulses, condiments, beverages, medicinal plants, their growth requirements and economic value.
- Basics of Biotechnology, different techniques used in biotechnology; its advantages and disadvantages to mankind.

S No	TOPIC	WEEK	MONTH
1	Economic Botany : Cultivated plants , An Introduction	1 st	JULY
2	Wheat : Origin , Morphology and uses	2 nd	
3	Rice: Origin , Morphology and uses	3 rd	
4	Pulses and vegetables	4 th	
5	Oils and Sugar	1 st	AUGUST
6	Spices	2 nd	
7	Beverages : Tea and Coffee	3 rd	
8	Fibre Yielding Plants	4 th	
9	Medicinal Plants	1 st	SEPTEMBER
10	Class test , Doubt solutions, Discussions	2 nd	
11	Introduction to Biotechnology : Tissue culture techniques	3 rd	
12	Micropropagation	4 th	
13	Embryo and Endosperm culture	1 st	OCTOBER
14.	Applications of Plant tissue culture in agriculture, forestry and horticulture	2 nd	
15	Introduction to r-DNA, Cloning Vehicles	3 rd	
16.	Gene transfer techniques in plants	4 th	
17	Transgenic plants	1 st	NOVEMBER
18	Agarose electrophoresis, blotting techniques	2 nd	
19.	DNA Fingerprinting	3 rd	
20	DNA Sequencing	4 th	
21.	PCR and reverse transcriptase	1 st	DECEMBER
22	Elisa, Hybridoma and monoclonal antibodies	2 nd	
23	Elisa and Immunodetection	3 rd	
24	Class test and Doubt sessions	4 th	
25	WINTER VACATIONS	1 st	JANUARY
		2 nd	
		3 rd	
		4 th	

		1 st	FEBRUARY
26	Class test and Doubt solutions	2 nd	
27	Molecular diagnosis of human disease	3 rd	
28	Human gene therapy	4 th	
29	Human gene therapy	1 st	MARCH
30	REVISION	2 nd	
31	REVISION	3 rd	
32	REVISION	4 th	

CLASS: BSc Third Year
 COURSE: Cell Biology and Molecular Biology (BOTA 303)
 LECTURES PER WEEK: 3

Course Outcomes (CO):

After the completion of this course students will be able to

- Know about different types of equipment needed to study details of cell structure.
- Recall once again the structure of organelle of cell they studied in lower classes.
- Study details of genetic material responsible for genetics and physiology of plants.

S No	TOPIC	WEEK	MONTH
1	Principles of microscopy: Light microscopy, Phase contrast microscopy	1 st	JULY
2	Fluorescence Microscopy, Electron Microscopy	2 nd	
3	Scanning EM and Scanning Transmission EM (STEM), X Ray diffraction analysis	3 rd	
4	Prokaryotic and Eukaryotic cells	4 th	
5	Mitochondria	1 st	AUGUST
6	Chloroplast	2 nd	
7	ER, Golgi Bodies and Lysosomes	3 rd	
8	Peroxisomes and Glyoxisomes , Nucleus	4 th	
9	Molecular organization : DNA	1 st	SEPTEMBER
10	Class test, Doubt solutions, Discussions	2 nd	
11	Cell Membrane	3 rd	
12	Cell Wall	4 th	
13	Class test and Doubt sessions	1 st	OCTOBER
14.	Cell Cycle, Mitosis	2 nd	
15	Meiosis	3 rd	
16.	DNA: Watson and Crick model, Harshey – Chase experiment,	4 th	
17	Types of DNA	1 st	NOVEMBER
18	Replication in DNA	2 nd	
19.	Class test and Doubt sessions	3 rd	
20	Types of structure of RNA	4 th	
21.	RNA Polymerase	1 st	DECEMBER
22	Translation	2 nd	
23	Genetic code	3 rd	
24	Class test and Doubt sessions	4 th	

25	WINTER VACATIONS	1 st	JANUARY
		2 nd	
		3 rd	
		4 th	
		1 st	FEBRUARY
26	Class test and Doubt solutions	2 nd	
27	LAC Operon	3 rd	
28	Tryptophan Operon	4 th	
29	Regulation of gene expression in Eukaryotes	1 st	MARCH
30	REVISION	2 nd	
31	REVISION	3 rd	
32	REVISION	4 th	