

**KAVAYITRI BAHINABAI CHAUDHARI NORTH
MAHARASHTRA UNIVERSITY, JALGAON**

Faculty of Science and Technology



**'A' Grade
NAAC Re-accredited
(3rd Cycle)**

F. Y. B. Sc. BOTANY

Theory and Practical Syllabus

(CBCS Pattern)

As Per U. G. C. Guidelines

Semester – I

To Be Implemented From

Academic – Year 2022 - 2023

BOT. – 101: Diversity of Lower Cryptogams

BOT. – 102: Morphology of Angiosperms

BOT. – 103: Practical Based on BOT.-101 and BOT.-102

F.Y. B.Sc. Semester: I

Paper: I BOT. 101: Diversity of Lower Cryptogams		Lecture 30
<p>Aims and Objectives:</p> <ol style="list-style-type: none"> 1. To study the diversity among microbes. 2. To study systematic, morphology and structure of Bacteria, Viruses, Algae and Fungi. 3. To study the life cycle pattern of Bacteria, Viruses, Algae and Fungi. 4. To study the useful and harmful activities of Bacteria, Viruses, Algae and Fungi. <p>Course outcomes:</p> <ol style="list-style-type: none"> 1. Provide identification technique of microbes, Viruses, Bacteria, Algae and Fungi. 2. Understand the systems of classification of Microbes, Viruses, Bacteria, Algae and Fungi, and its interdisciplinary approaches. 3. Provide lab-based training in writing short species descriptions and illustration. 4. Recognise members of the major microbes, Viruses, Bacteria, Algae, Fungi and their medicinal, economic importance for human welfare. 		
Unit 1	<p>Microbes:</p> <p>1.1: Introduction and main groups of microbes: Prions, Viroids, Viruses, Rickettsias, Mycoplasmas, Bacteria, Cyanobacteria.</p> <p>1.2: Classification of microorganisms – R.H. Whittaker’s (1969) five kingdom concept.</p>	02 L
Unit 2	<p>Viruses:</p> <p>2.1: Introduction, discovery and characteristics of Viruses.</p> <p>2.2: General morphology of viruses: Helical, Polyhedral, Enveloped and Complex viruses.</p> <p>2.3: Nature of viruses (living and non-living)</p> <p>2.4: Ultra structure of viruses</p> <p>2.5: DNA Virus (T-Phase) and RNA, Virus (TMV)</p> <p>2.6: Reproduction of Bacteriophage: Lytic and Lysogenic cycle.</p> <p>2.7: Economic importance</p> <p>2.8: Plant diseases caused by viruses w.r.t. causal organism, symptoms and control measures of.</p> <ol style="list-style-type: none"> i. Yellow vein mosaic disease of Lady’s finger. ii. Bunchy top of Banana. 	06 L
Unit 3	<p>Bacteria:</p> <p>3.1: Introduction, discovery and general characters.</p> <p>3.2: Classification of Bacteria on the basis of morphology.</p> <p>3.3: Ultrastructure of Bacterial Cell</p> <p>3.4: Gram positive and Gram negative Bacteria</p>	06 L

	<p>3.5: Reproduction - Asexual and Sexual (Conjugation)</p> <p>3.6: Economic importance of Bacteria - useful and harmful activities</p> <p>3.7: Study of Bacterial diseases w.r.t. causal organism, symptoms and control measures of i) Citrus canker ii) Black arm of Cotton.</p>	
Unit 4	<p>Algae:</p> <p>4.1: Introduction, definition and general characters of algae</p> <p>4.2: Habitats of algae: aquatic, terrestrial and algae unusual habitats</p> <p>4.3: Thallus structure in algae.</p> <p>4.4: Reproduction: vegetative, asexual and sexual</p> <p>4.5: Classification of algae according to G. M. Smith (1955) up to classes with reasons giving at least two examples from each class.</p> <p>4.6: Economic importance of algae in;</p> <p style="padding-left: 20px;">i) Agriculture</p> <p style="padding-left: 20px;">ii) Food</p> <p style="padding-left: 20px;">iii) Industries</p> <p style="padding-left: 20px;">iv) Medicine</p> <p>4.7: A] Study of life cycle of <i>Nostoc</i> w.r.t. Systematic position Occurrence, structure of colony and filament, ultrastructure of <i>Nostoc</i> cell and reproduction</p> <p style="padding-left: 20px;">B] Study of life cycle of <i>Sargassum</i> w.r.t. Systematic position, occurrence, external and internal structure of thallus, reproduction and alternation of generation.</p>	07 L
Unit 5	<p>Fungi:</p> <p>5.1: Introduction, definition and general characters</p> <p>5.2: Thallus structure, reproduction and mode of nutrition</p> <p>5.3: Classification of Fungi, according to G.M. Smith up to classes with reasons giving at least two example of each class.</p> <p>5.4: Economic importance of Fungi</p> <p style="padding-left: 20px;">i) Agriculture</p> <p style="padding-left: 20px;">ii) Food</p> <p style="padding-left: 20px;">iii) Industries</p> <p style="padding-left: 20px;">iv) Medicine</p> <p>5.5: A] Study of life cycle <i>Agaricus</i> w. r. t. Systematic position, structure of mycelium, internal structure, (T.S. of gills) and reproduction.</p> <p style="padding-left: 20px;">B] Study of life cycle <i>Aspergillus</i>. w. r. t. Systematic position, structure of mycelium and reproduction.</p>	07 L
Unit 6	<p>Lichens and Mycorrhiza:</p> <p>6.1 Lichens: definition, characters, types - Crustose, Foliose, Fruticose and economics importance.</p> <p>6.2 Definition, general account, significance of Mycorrhiza,</p> <p>6.3 Types: Ectomycorrhiza and Endomycorrhiza.</p>	02 L
Suggested readings:		

1. Agrawal, S. B. and Srivastav (1985) Modern Text Book of Botany Vol. I Algae, Fungi, Bacteria Viruses and Lichen, Universal Publication, Agra.
2. Biswas, S. B. and Amita Biswas (1986 Ed.) An Introduction to Viruses, Vikas Publishing House (P) Ltd. New Delhi.
3. Vashista, B.R. (2010) S. A Text Book of Algae S. Chand and Company (P.) Ltd New Delhi.
4. Vashista, B.R. (2010) S. A Text Book of Fungi S. Chand and Company (P.) Ltd New Delhi.
5. Sarabhai, B. P. & Arora C.K. (1995). A Text Book of Algae Anmol Publication, New Delhi.
6. Salle, A.J. (1974) Fundamental Principles of Bacteriology (TMH Ed.) New Delhi.
7. Gangulee, H.C. and Kar, A.K. (1998) College Botany Vol. II New Central Book Agency, Kolkota.
8. Pandey B. P. (2014) College Botany Volume 1S. Chand publications, New Delhi.
9. Pandey, S. N. and Trivedi (1997) A Text Book of Botany Vol. I Vikas Publishing House, New Delhi.
10. Sharma, P D. (1998) A Text Book of Fungi Rastogi Publication, Meerut.
11. Sharma, P D. (2009) A Text Book of Algae Tata McGraw Hill Publication, New Delhi

F.Y. B.Sc. Semester I

Paper II BOT 102: Morphology of Angiosperms		Lecture 30
<p>Aims and objectives:</p> <ol style="list-style-type: none"> 1. To inculcate the students with angiosperm plant body. 2. To study vegetative characteristics of angiosperm plants. 3. To study reproductive characteristics of angiosperm plants. 4. To study modifications and functions of plant organs. <p>Course outcomes:</p> <ol style="list-style-type: none"> 1. Students will able to understand ground plan of angiospermic plant. 2. Students will aware about vegetative and reproductive characteristics of angiospermic plant. 3. Students will able to understand the modifications and functions of plant parts. 		
Unit 1	<p>Introduction:</p> <ol style="list-style-type: none"> 1.1 Definition and scope of Morphology 1.2 Plant body – Root system, Shoot system 	02 L
Unit 2	<p>Root:</p> <ol style="list-style-type: none"> 2.1 Definition 2.2 Characteristics of root 2.3 Functions of root 2.4 Types of root 2.5 Modifications of root for: <ol style="list-style-type: none"> a) Food storage:- Fusiform, Conical, Napiform, Tuberos root. b) Support:-roots, Stilt roots, Climbing roots c) Breathing:- Pneumatophores d) Special functions:- Epiphytic roots, Sucking roots 	04 L
Unit 3	<p>Stem:</p> <ol style="list-style-type: none"> 3.1 Definition 3.2 Characteristics of stem 3.3 Functions of stem 3.4 Forms of stem: <ol style="list-style-type: none"> a) Strong form :- Herb, Shrub, Tree b) Weak form:- Creepers, Trailers and Climbers 3.5 Modifications of stem: <ol style="list-style-type: none"> a) Underground:- Rhizome, Stem tuber, Bulb and Corm b) Sub-aerial:- Runner, Stolon, Offset and Sucker c) Aerial:- Phylloclade, Cladode, Thorn, Stem tendril and Bulbil 	04 L
Unit 4	<p>Leaf:</p> <ol style="list-style-type: none"> 4.1 Definition 4.2 Parts of leaf 	04L

	<p>4.3 Types of stipules</p> <p>4.4 Types of leaf</p> <p>4.5 Functions of leaf</p> <p>4.6 Phyllotaxy:- definition and types: Alternate, Opposite (Decussate and Superposed) and Whorled.</p> <p>4.7 Venation:- Definition and types: Reticulate and Parallel venation</p> <p>4.8 Modifications of leaf:- leaf spines, leaf tendrils, fleshy leaves, phyllode, pitcher and bladder.</p>	
Unit 5	<p>Inflorescence :</p> <p>5.1 Definition, Significance and parts of inflorescence</p> <p>5.2 Types of inflorescence</p> <p>a) Racemose:- Raceme, Spike, Spikelet, Catkin, Spadix, Corymb, Umbel, Capitata and Head or Capitulum</p> <p>b) Cymose:- Solitary, Uniparous, Biparous and Multiparous</p> <p>c) Special type of inflorescence:-Cyathium, Verticillaster and Hypanthodium</p>	05L
Unit 6	<p>Flower:</p> <p>6.1 Definition</p> <p>6.2 Parts of typical flower</p> <p>6.3 Types of flower:- Hypogynous, Epigynous and Perigynous</p> <p>6.4 Symmetry of flower :- Actinomorphic and Zygomorphic</p> <p>6.5 Calyx:- Polysepalous calyx, Gamosepalous calyx, Caducous calyx, Deciduous calyx, Persistent calyx and Petaloid calyx</p> <p>6.6 Corolla:</p> <p>a) Forms of polypetalous corolla: Cruciform, Caryophyllaceous, Rosaceous and Papilionaceous</p> <p>b) Forms of gamopetalous corolla:- Campanulate, Infundibuliform, Tubular, Rotate, Hypocrateriform, Ligulate, Bilabiate and Personate</p> <p>6.7 Perianth:- Polyphyllous and Gamophyllous</p> <p>6.8 Aestivation:- i) Definition ii) Types of Aestivation.</p> <p>6.9 Androecium:</p> <p>a) Attachment of anther to filament:- Basifixed, Dorsifixed and Versatile</p> <p>b) Cohesion and Adhesion of stamens.</p> <p>6.10 Gynoecium:</p> <p>a) Apocarpous, Syncarpous, Monocarpellary, Bicarpellary and Polycarpellary</p> <p>b) Placentation: Definition and types of Placentation.</p>	06 L
Unit 7	<p>Fruits:</p> <p>7.1 Definition</p> <p>7.2 Parts of typical fruit : nature of Pericarp</p> <p>7.3 Types of fruits:-</p> <p>a) Simple fruits:-</p> <p>i) Dry fruits:</p>	05 L

	<p>a) Dehiscent:- Legume and Loculicidal Capsule b) Schizocarpic:-Lomentum and Regma c) Indehiscent:- Caryopsis, Cypsela</p> <p>ii) Fleshy fruits:-</p> <p>a) Drupe and Hesperidium b) Aggregate fruits:- Etaerio of berries and Etaerio of follicle c) Composite fruits:- Sorosis and Syconus.</p>	
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Suggested readings:

1. Gangulee H.C. Das K.S., Dutta C. (2014) College Botany Volume I, New Central Book Agency (P) Ltd. Kolkata.
2. Dutta A.C. (2013) Botany for Degree Students, Sixth edition, Oxford University Press, New Delhi.
3. Sachdeva S.K. (1990) Angiosperms – Morphology, Anatomy, Taxonomy, Evolution, Kalyani Publication, Ludhiana.
4. Pandey S.N. Mishra S.P. (2009) Taxonomy of Angiosperms, Ane Books Pvt. Ltd., New Delhi.
5. Singh M.P. Sharma A.K. (2002) Textbook of Botany, Anmol Publication, Pvt. Ltd., New Delhi.
6. Sundararajan S. (2003) Practical Manual of Plant Morphology, Anmol Publication, Pvt. Ltd., New Delhi.
7. Bendre A. Kumar A. (1999) A Textbook of Practical Botany II, Rastogi Publication, Meerut

F.Y. B.Sc. Semester I

Paper III Bot-103: Practical (Based on Bot.101 and Bot.102)

Practical – 1 : Study of Equipment, Chemicals and Stains used in Botany laboratory:

- A) Equipment: Dissecting microscope, Compound Microscope
- B) Chemicals:
 - i) Preservatives: FAA
 - ii) Stains: Safranin, Light green, Fast green, Cotton blue, Crystal violet,
 - iii) Mounting media; Glycerine, Lactophenol.

Practical - 2: A) Study of viruses and bacteria using electron photomicrographs (TMV, Bacteriophage, Cocci, Bacillus, Spirillum Bacteria).

B) Technique of Gram staining of bacteria.

Practical – 3 & 4 : A) Study of Plant diseases w.r.t. causal organism, symptoms and control

measures of the following:

- a. Virus.
 - i. Yellow vein mosaic disease of Lady's finger
 - ii. Bunchy top of Banana
- b. Bacteria
 - i. Citrus canker
 - ii. Black arm of cotton
- c. Fungi
 - i. Green mould of citrus fruits
 - ii. White rust disease (Specimen/P.S.)/Tikka disease on groundnut [P.S.] (Any one)

B) Study of growth forms of lichens (Crustose, Foliose and Fruticose) specimens / P.S./ Photographs

C) Study of Mycorrhiza: (Ectomycorrhiza and Endomycorrhiza) by Photographs.

Practical -5& 6: Study of systematic position, vegetative and reproductive structures of the following:

- A. *Nostoc*
 - i) Vegetative structure -Filament and cell
 - ii) Reproductive structure (P.S.)
- B. *Sargassum*
 - i) Vegetative structure
 - ii) T. S. of main axis
 - iii) Reproductive structure male and female conceptacles (P.S.)
- C. *Aspergillus*
 - i) Structure of thallus: mycelium,

ii) Reproductive structures asexual (Conidiophore and Conidia)

D. *Agaricus*

i) Structure of basidiocarp

ii) Reproductive structures: basidia and basidiospores (V. S. of Gill)

Practical -7: Study of morphology of root and stem modifications as per theory.

Practical – 8 : Study of

- a) Parts of leaf
- b) Types of stipules
- c) Types of leaf
- d) Types of phyllotaxy
- e) Types of venation
- f) Modifications of leaf as per theory

Practical – 9 : Study of types of inflorescence as per theory.

Practical – 10 : Study of

- a) Calyx – types of calyx as per theory
- b) Corolla – forms of corolla as per theory
- c) Types of aestivation

Practical -11: Study of

- a) Androecium – Cohesion and Adhesion
- b) Gynoecium– types of placentation.

Practical -12: Study of types of fruits as per theory.

Submission: 1. Excursion tour report

Note: Short or long excursion tour and visit to any botanical garden are compulsory.

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Theory and Practical Syllabus

(CBCS Pattern)

As Per U. G. C. Guidelines

Semester – II

To Be Implemented From

Academic Year 2022 - 2023

BOT. – 201: Diversity of Higher Cryptogams

BOT. – 202: Taxonomy of Angiosperms

BOT. – 203: Practical Based on BOT.-201 and BOT.-202

F.Y. B.Sc. Semester II

Paper I Bot-201: Diversity of Higher Cryptogams		Lecture 30
<p>Aims and objectives:</p> <ol style="list-style-type: none"> 1. To study salient features of higher Cryptogams. 2. To know the morphology and systematics of higher cryptogams. 3. To study the life cycles of selected genera. 4. To study economic importance of higher cryptogams. <p>To make the students aware about conservation and sustainable use of plants.</p> <p>Course outcomes:</p> <ol style="list-style-type: none"> 1. Student will be able to understand the basic knowledge of the subject. 2. To understand the basic structure and study the comparative characteristic of Bryophytes and Pteridophytes. 3. Also, to understand the structural similarities and differences among both the groups. 4. Student will be able to aware developmental stages of life cycle of higher cryptogamic plants. <p>To facilitate students for taking up and shaping a successful career in botany.</p>		
Unit 1	<p>Introduction:</p> <ol style="list-style-type: none"> 1.1: Introduction, definition and diversity of higher cryptogams. 1.2: Bryophytes - a) Introduction. b) Habit and habitat. c) General characteristics of Bryophytes. d) Alternation of generations. 1.3: Classification of Bryophytes according to G. M. Smith (1955) up to classes with reasons, giving at least two examples from each class. 1.4: Economic and ecological importance of Bryophytes. 	05 L
Unit 2	<p>Study of life cycle of <i>Riccia</i>:</p> <ol style="list-style-type: none"> 2.1: Systematic position with reasons. 2.2: Habit and habitat. 2.3: External and internal structure of gametophyte. 2.4: Vegetative reproduction. 2.5: Sexual reproduction (Development of sex organs not expected) 2.6: Fertilization. 2.7: Structure of mature sporophyte. 2.8: Structure and germination of spores. 2.9: Alternation of generation. 	05 L
Unit 3	<p>Study of life cycle of <i>Funaria</i>:</p> <ol style="list-style-type: none"> 3.1: Systematic position with reasons. 3.2: Habit and habitat. 3.3: External and internal structure of gametophyte. 3.4: Vegetative reproduction. 	05 L

	<p>3.5: Sexual reproduction (Development of sex organs not expected)</p> <p>3.6: Fertilization.</p> <p>3.7: Structure of mature sporophyte.</p> <p>3.8: Alternation of generation.</p>	
Unit 4	<p>Pteridophytes:</p> <p>4.1: Introduction, definition and general characteristics of Pteridophytes.</p> <p>4.2: Habit and Habitat.</p> <p>4.3: Classification of Pteridophytes according to G. M. Smith (1955) up to classes with reasons, giving at least two examples from each class.</p> <p>4.4: Economic importance of Pteridophytes.</p>	04 L
Unit 5	<p>Study of life cycle of <i>Selaginella</i>:</p> <p>5.1: Systematic position with reasons.</p> <p>5.2: Habit and habitat.</p> <p>5.3: External and internal structure of sporophyte.</p> <p>5.4: Asexual reproduction: position and structure of strobilus.</p> <p>5.5: Sporangia (megasporangium and microsporangium).</p> <p>5.6: Structure and germination of spores.</p> <p>5.7: Structure of male and female gametophyte.</p> <p>5.8: Position and structure of sex organs. (Development of sex organs not expected)</p> <p>5.9: Fertilization.</p> <p>5.10: Structure of mature embryo.</p> <p>5.11: Alternation of generations.</p> <p>5.12: Heterospory and its significance</p>	06L
Unit 6	<p>Study of life cycle of <i>Adiantum</i> :</p> <p>6.1: Systematic position with reasons.</p> <p>6.2: Habit and habitat.</p> <p>6.3: External and internal structure of sporophyte.</p> <p>6.4: Asexual reproduction: position and structure of sorus.</p> <p>6.5: Structure of sporangium.</p> <p>6.6: Structure and germination of spore.</p> <p>6.7: Structure of mature gametophyte.</p> <p>6.8: Position and structure of sex organs. (Development of sex organs not expected).</p> <p>6.9: Fertilization.</p> <p>6.10: Alternation of generation.</p>	05 L

Suggested readings:

1. Gangulee, H.C. and Kar, A.K. (2001). College Botany Vol. II. Books and Allied Press Ltd. Kolkata.
2. Pandey, S.N. and Trivedi, P.S. (1997). A Text Book of Botany Vol. II, Vikas Publishing House (P.) Ltd. New Delhi.
3. Parihar, N.S. (1977). Biology and Morphology of Pteridophytes. Central Book Depot, Allahabad.

4. Parihar, N.S. (1984). An Introduction to Embryophyta Vol. I Bryophyta. Central Book Depot, Allahabad
5. Rashid, A. (1996). An Introduction to Bryophyta. Vikas Publishing House Ltd. New Delhi.
6. Rashid, A. (1996). An Introduction to Pteridophyta. Vikas Publishing House Ltd
7. Saxena, A.K. and Sarbhai, R.M. (1992). A Text Book of Botany Vol. II Embryophyta.
8. Ratan Prakashan Mandir, Agra.
9. Smith, G.M. (1995). Cryptogamic Botany. Vol. II (Bryophytes and Pteridophytes).
10. Mc Graw-Hill Book Company, New York and London.
11. Sporne, K.R. (1995). The Morphology of Pteridophyta. The Hutchinson University Library, London, U.K.
12. Vashistha, B.R. (1997). Botany For Degree Students-Bryophyta. S. Chand and company (P.) Ltd. New Delhi.
13. Vashistha, P.C. (1984). Pteridophytes. S. Chand and company (P.) Ltd. New Delhi

F.Y. B.Sc. Semester II

Paper II Bot-202: Taxonomy of Angiosperms		Lecture 30
<p>Aims and objectives:</p> <ol style="list-style-type: none"> 1. To study the diversity of angiosperms. 2. To study of comparative account among the families of angiosperm. 3. To study the economic importance of the angiospermic plants. 4. To study the distinguishing features, medicinal and economic importance of angiosperm families. 5. To study botanical garden and herbarium techniques. <p>Course outcomes:</p> <ol style="list-style-type: none"> 5. Understanding of angiospermic plants Causes of phenomenal succession and alternation of generation. 6. Understand the systems of classification of angiosperms, nomenclature and interdisciplinary approaches. 7. Provide lab-based training in writing short species descriptions and illustration. 8. Recognise members of the major angiosperm families by identifying their diagnostic features, economic and medicinal importance. 9. Understand botanical gardens and herbarium technique 		
Unit 1	<p>Introduction</p> <p>1:1 Definition, scope and importance of taxonomy.</p> <p>1:2 General characters of Angiosperms.</p> <p>1:3 Causes of phenomenon succession of Angiosperms.</p> <p>1:4 Alternation of generations.</p> <p>1:5 Taxonomy and systematics: synonyms.</p>	06 L
Unit 2	<p>Taxonomic hierarchy</p> <p>2:1 Functions of Taxonomy: identification, classification and nomenclature.</p> <p>2:2 Ranks of classification; major categories.</p> <p>2:3 Binomial nomenclature.</p> <p>2:4 Author citation and rejection of name.</p> <p>2:5 Numerical Taxonomy; definition and applications.</p>	06 L
Unit 3	<p>Classification</p> <p>3:1 Types of classification</p> <p style="padding-left: 40px;">a) Artificial</p> <p style="padding-left: 40px;">b) Natural</p> <p style="padding-left: 40px;">c) Phylogenetic</p> <p>3:2 Outline of Bentham and Hooker's system of classification up to series.</p> <p>3:3 Merits and demerits.</p>	06L

Unit 4	Study of plants families w.r.t. systematic position, general characters, distinguishing characters and economic importance. a) Malvaceae b) Papilionaceae (Fabaceae). c) Rubiaceae d) Solanaceae e) Euphorbiaceae f) Cannaceae	06 L
Unit 5	Botanical Gardens and Herbarium. 5:1) Botanical garden. a) Definition and Functions b) Special feature of following Botanical Garden. i) Indian Botanical Garden, Kolkata ii) Royal Botanical Garden, Kew England. 5:2) Herbarium. a) Definition, techniques and functions. b) Importance of herbaria.	06L
Suggested readings: <ol style="list-style-type: none"> Gangully, H.C & K.S Das (1986) College Botany Vol. – 1 (6th Edition) , New Central book Agency, Calcutta , India. Gangully H.C., K. S.Das and C.T Datta (1968) college Botany Vol.1 , New Central Book Agency , Calcutta , India. Kumar, N.C (1992) An Introduction to Taxonomy of Angiosperm, Himalaya Publishing House, Bombay India. Lawrence G.H.M (1951) Taxonomy of Vascular plants. Macmilan , New York , USA. Naik , V. N (1984) Taxonomy of Angiosperms . Tata McGraw – Hil publishing Company Ltd , New Delhi , India Pandey B.P. (1997) Taxonomy of Angiosperms . S. Chand & Company Ltd., New Delhi, India. Sharma , O.P. (1997) Plants Taxonomy . Tata McGraw – Hill Publishing Co.Ltd . New Delhi, India Shivarajan , V.V . (1984) Introduction to Principles of Principles of Plants Taxonomy . Oxford & IBHP publishing Co.New Delhi , India Singh V. And Jain , D.K (1992) Taxonomy of Angiosperms. Rastogi publication , Meerut, India. Subramanyam , N.S. (1997) Modern plants Taxonomy . Vikas Publishing house, New Delhi ,India. MukerjeeSusilkumar (1984) College Botany Vol.3 Published by J.N.SenB.S.I.New central Book Agency Calcutta. Vashistha , P.C. (1992) Taxonomy of Taxonomy of Angiosperms. R.Chand& Co. Publishers , New Delhi , India. 		

F.Y. B.Sc. Semester II

Paper III

Bot-203: Practical (Based on Bot.201 and Bot.202)

Practical - 1: Study of diversity of Bryophytes w.r.t systematic position and morphology of:

a) *Marchantia* b) *Anthoceros* c) *Sphagnum*

Practical - 2: Study of *Riccia*:

2.1: Systematic Position with reasons

2.2: External morphology

2.3: Mounting of scales and rhizoids

2.4: V. S. of Thallus

2.5: V. S. of thallus showing antheridia [P. S.]

2.6: V.S. of thallus showing archegonia [P.S.]

2.7: V.S. of sporophyte [P.S.]

Practical - 3: Study of *Funaria*:

3.1: Systematic Position with reasons

3.2: External morphology

3.3: T. S. of axis

3.4: V.S. of antheridial head [P.S.]

3.5: V.S. of archegonial head [P.S.]

3.6: V.S. of Capsule [P.S.]

3.7: Mounting of spores and peristomial teeth

Practical - 4: Study of diversity of Pteridophytes w.r.t systematic position and morphology of:

a) *Psilotum*

b) *Lycopodium*

c) *Equisetum*

Practical - 5: Study of *Selaginella*:

5.1: Systematic Position with reasons

5.2: External morphology

5.3: T. S. of Stem

5.4: Mounting of micro and megaspores

5.5: T. S. of Leaf [P.S.]

5.6: V. S of Strobilus [P.S.]

Practical - 6: Study of *Adiantum*:

6.1: Systematic Position with reasons

6.2: External morphology

6.3: T. S. of Rachis

6.4: T. S. of Sorus [P. S.]

6.5: Mounting of spores

Practical -7: How to describe Angiospermic plant.

Practical -8, 9&10: Study of plant families according to syllabus w.r.t Systematic position, morphological characters, floral formula and floral diagram.

i) Malvaceae

iii) Rubiaceae

v) Euphorbiaceae

ii) Papilionaceae/ Fabaceae

iv) Solanaceae

vi) Cannaceae

Practical -11: Preparation of artificial key based on vegetative & reproductive characters.

Practical -12: Herbarium and its techniques.

Submission:

1. Any five photographs of higher cryptogamic plants
2. Any five wild plant (Weeds) herbarium/photograph.
3. Excursion tour report

Note: Short or long excursion tour and visit to any botanical garden are compulsory.

Equivalence

		Old Syllabus w.e.f. June, 2018	New Syllabus, w.e.f. June 2022	
Sr. No.	Paper	Title	Paper	Title
SEMESTER-I				
1	BOT.101	Microbial Diversity of Algae and Fungi	BOT.101	Diversity of Lower Cryptogams
2	BOT.-102	Plant Taxonomy	BOT.-102	Morphology of Angiosperms
3	BOT.-103	Practical Course based on BOT-101 and BOT.-102	BOT.-103	Practical Course based on BOT-101 and BOT.-102
SEMESTER-II				
4	BOT.201	Diversity of Archegoniate	BOT.201	Diversity of Higher Cryptogams
5	BOT.-202	Plant Ecology	BOT.-202	Morphology of Angiosperms
6	BOT.-203	Practical Course based on BOT-201 and BOT.-202	BOT.-203	Practical Course based on BOT-201 and BOT.-202