

**BHAVNAGAR UNIVERSITY**

**BHAVNAGAR**

**(NACC Accreditation Grade “B”)**

**CREDIT AND SEMESTER SYSTEM**

**SYLLABUS**

**BACHELOR OF SCIENCE (B.Sc.)**

**BOTANY**

**(In Force From Academic Year: 2011-2012)**

तमसो मा ज्योतिर्गमय



- ♣ The course content has been designed on **Semester pattern: Two semesters (III & IV)** in Academic Year.
- ♣ The work load for theory: There shall be **three lectures** per paper in a week set up by department.
- ♣ The work load for Practical: There shall be **three Practicals** in a week set up by department.
- ♣ There shall be **three theory paper** and **one practical paper** in Semester end Examination.
- ♣ The University Theory examination comprise of 3 **theory papers**.
- ♣ Each theory paper shall be of **2 hours** duration and carry 70 **marks**.
  
- ♣ **Internal Marks: 30**
  - **Component – I** (Assignments - 10 Marks) per theory Paper
  - **Component – II** (Seminar - 10 Marks) per theory Paper
  - **Component – III** (Test - 10 Marks) per theory Paper.
  
- ♣ Practical Examination: 12 Hours (in 02 days, 03 hours per session)
- ♣ Practical paper: **90 Marks**
  1. 1<sup>st</sup> day [40 marks]
  2. +2<sup>nd</sup> day [40 marks]
  3. +[10 marks journal]



**B.Sc.**  
Credit and Semester System Syllabus

NAME OF THE SUBJECT: **BOTANY**

SEMESTER: **3<sup>rd</sup>**

<b>SR. NO.</b>	<b>PAPER NO</b>	<b>NAME OF THE PAPER</b>	<b>TOTAL MARKS EXT+INT*= TOTAL</b>	<b>PASSING STANDARD EXT+INT=TOTAL</b>	<b>TOTAL TEACHING HOURS</b>	<b>UNIVERSITY EXAM. HOURS</b>	<b>CREDITS</b>
1	B-301	Viruses, Bacteria, Algae, Fungi, Plant pathology, Bryophytes, Pteridophytes (Theory)	70 + 30* = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03	03
2	B-302	Gymnosperms, Paleobotany, Morphology, Systematic botany, Taxonomy, Embryology (Theory )	70 + 30* = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03	03
3	B-303	Plant Anatomy, Ecology (Theory)	70 + 30* = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03	03
4	B-304	Practicals	90 + 00 = 90	36 + 00 = 36	15 Weeks x 09 Hours = 135	09	09
		<b>TOTAL</b>	<b>300 + 90 = 390</b>	<b>120 + 36 = 156</b>		<b>18</b>	<b>18</b>

<u><b>* INTERNAL</b></u>	<u><b>MARKS</b></u>
ASSIGNMENT	10
SEMINAR	10
TEST	10



**B.Sc.**  
Credit and Semester System Syllabus

NAME OF THE SUBJECT: **BOTANY**

SEMESTER: **4<sup>th</sup>**

<b>SR. NO.</b>	<b>PAPER NO</b>	<b>NAME OF THE PAPER</b>	<b>TOTAL MARKS EXT+INT*=TOTAL</b>	<b>PASSING STANDARD EXT+INT=TOTAL</b>	<b>TOTAL TEACHING HOURS</b>	<b>UNIVERSITY EXAM. HOURS</b>	<b>CREDITS</b>
1	B-401	Economic botany, Ethno botany, Horticulture, Pharmacognosy (Theory)	70 + 30* = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03	03
2	B-402	Plant Physiology & Plant Biochemistry (Theory)	70 + 30* = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03	03
3	B-403	Cytology, Genetics, Embryology (Theory)	70 + 30* = 100	28 + 12 = 40	15 Weeks x 03 Hours = 45	03	03
4	B-404	Practicals	90 + 00 = 90	36 + 00 = 36	15 Weeks x 09 Hours = 135	09	09
		<b>TOTAL</b>	<b>300 + 90 = 390</b>	<b>120 + 36 = 156</b>		<b>18</b>	<b>18</b>

<b>* <u>INTERNAL</u></b>	<b><u>MARKS</u></b>
ASSIGNMENT	10
SEMINAR	10
TEST	10

There shall be Local Excursion (*Principal and Subsidiary subject*) and Botanical study tour in any part of India (for only Principal subject) for the study of Plants. [Including visit to Forest, Plant Science based Research and Government Institutions.] Students shall have to submit Field report / Tour report in their Journal.



**B.Sc. (BOTANY)  
SEMESTER – III**

Paper No. B-301: Virus, Bacteria, Algae, Fungi, Plant Pathology. Bryophytes, Pteridophytes

**Credit: 03**

**Total Marks: 100**  
**Marks: Semester End Examination: 70**  
**Continues Internal Evaluation: 30**

UNIT	DETAILED SYLLABUS	TEACHING HOURS	MARKS / WEIGHT
Unit – I	<b>BACTERIA:</b> Gram staining & Photosynthetic Bacteria.	02	23
	<b>ALGAE :</b> Classification (As per F.E. Fristch) Occurrence and distribution, Thallus organization and life histories of following algae belonging to various classes:	01	
	Cyanophyceae: Oscillatoria,	02	
	Chlorophyceae: Chara,	03	
	Xanthophyceae: Botrydium,	03	
Rhodophyceae: Batrachospermum	03		
Unit – II	<b>FUNGI:</b> Classification (As per Ainsworth)	01	23
	Occurrence and distribution, Thallus organization, and life histories of following Fungi belonging to various classes:		
	Mastigomycotina: Pythium	02	
	Zygomycotina: Pilobolus	02	
	Ascomycotina: Penicillium	02	
	Basidiomycotina: Polyporus	02	
	<b>PLANT PATHOLOGY:</b>		
Study of White rust of Crucifers: Symptoms, Causal Organism Control	02		
<b>VIRUSES:</b> General Characters			
Effects of viruses on Plants (External symptoms),	02		
Study of Viruses: Leaf curl of Papaya, Yellow vein mosaic of Bhindi.	02		
Unit – III	<b>BRYOPHYTES:</b> Classification (As per G. M. Smith):		24
	Occurrence and distribution, Thallus organization, and life history and alternation of generation of following Bryophytes belonging to various classes: (Developments of organs are excluded.)		
	Hepaticae : Riccia	04	
	Anthocerotaceae: Anthoceros	04	
	<b>PTERIDOPHYTES:</b> Classification (As per G. M. Smith) Occurrence and distribution, anatomy, reproduction, life history and alternation of generation of following Pteridophytes belonging to various divisions (Developments of organs are excluded.)		
Calamophyta: Equisetum	04		
Pterophyta: Marselia	04		

**Break up of Continuous Internal Evaluation:**

1. Assignments 10 Marks
  2. Seminar 10 Marks
  3. Test 10 Marks
- Total Marks 30 Marks**



Paper No. B-302: Gymnosperms, Palaeobotany, Morphology, Systematic Botany, Taxonomy, Embryology:

**Credit: 03**

**Total Marks: 100**  
**Marks: Semester End Examination: 70**  
**Continues Internal Evaluation: 30**

UNIT	DETAILED SYLLABUS	TEACHING HOURS	MARKS / WEIGHT
Unit – I	<b><u>GYMNOSPERMS:</u></b> General characters – Classification (As per Chamberlain) Anatomy, Reproduction, life history, alternation of generation of following gymnosperms. (Developments of organs are excluded.) Coniferales: Pinus, Gnetales: Gnetum	02  05 05	23
	<b><u>PALAEOBOTANY:</u></b> The fossilization process, Types of fossils	03	
	<b><u>SYSTEMATIC BOTANY:</u></b> Introduction to ICBN (International code of Botanical nomenclature) Herbarium techniques, Computer Herbaria: A Brief account. Introduction to Botanical survey of India. Botanical Gardens	03 03 02 02	
Unit – II	<b><u>MORPHOLOGY:</u></b> Morphology of Leaf apex: Acute, Obtuse, Acuminate, Cuspidate, Emerginate, Cirrhose, Apiculate Morphology of Fruit: Simple, aggregate and composite fruits.	01 04	23
	<b><u>ANGIOSPERM TAXONOMY:</u></b> Introduction Outline Classification of following families according to Bentham & Hooker's classification system General characters, floral structure, floral formula, floral diagram and common examples of economic and ethno botanical important plants of following families:	02 02 02	
Unit – III	1. Anonaceae	01	24
	2. Meliaceae	01	
	3. Caesalpinaceae	01	
	4. Asteraceae	01	
	5. Asclepiadaceae	01	
	6. Bignoniaceae	01	
	7. Verbenaceae	01	
	8. Euphorbiaceae	01	
	9. Commelinaceae	01	

**Break up of Continuous Internal Evaluation:**

1. Assignments	10 Marks
2. Seminar	10 Marks
3. Test	10 Marks
<b>Total Marks</b>	<b>30 Marks</b>



Paper No. B-303: Plant Anatomy, Ecology

**Credit: 03**

**Total Marks: 100**  
**Marks: Semester End Examination: 70**  
**Continues Internal Evaluation: 30**

UNIT	DETAILED SYLLABUS	TEACHING HOURS	MARKS / WEIGHT
<b>Unit – I</b>	<p><b><u>PLANT ANATOMY:</u></b> <b>Organization of the higher plant body: -</b> The shoot and root systems variation in habit and longevity, environmental influences Shoot apical meristem. Root apical meristem Lateral meristem and their functions Epidermal Tissue system Mechanical Tissue system Secretory Tissue system</p>	02 02 02 03 03 03	23
<b>Unit – II</b>	<p><b><u>PLANT ANATOMY:</u></b> <b>Normal Secondary Growth:</b> Secondary Growth in Perennials Cucurbita stem Capparis stem <b>Anomalous secondary growth:</b> Anomalous primary structure of Nyctanthus stem Medullary bundles in Boerhavia stem Anomalous secondary growth in Tinospora and Beet root</p>	01 02 02 02 02 02 02	23
<b>Unit – III</b>	<p><b><u>ECOLOGY:</u></b> Aim &amp; Scope, concept of ecology Factors – Biotic and A biotic (Climatic, Edaphic and Topographic) Climatic, edaphic and biotic factors infusing the growth of plants Ecological pyramids Ecological classification of plants. External features of Hydrophytes and Xerophytes Pollution – Types, causes and control measures Air Pollution Water Pollution</p>	01 02 02 02 04 02 02	24

**Break up of Continuous Internal Evaluation:**

- |                    |                 |
|--------------------|-----------------|
| 1. Assignments     | 10 Marks        |
| 2. Seminar         | 10 Marks        |
| 3. Test            | <u>10 Marks</u> |
| <b>Total Marks</b> | <b>30 Marks</b> |



Paper No. B-304: Practicals

Credit: 09

Total Marks: 90 (External Only)

UNIT	DETAILED SYLLABUS	TEACHING HOURS	MARKS / WEIGHT
Paper 304	<b>SECTION-A Based on theory B-301:</b> <b>Practical study of following types through available Fresh / preserved materials, Permanent slides, charts, and models:</b>		30
1	To study Viruses: Leaf curl of Papaya, Yellow vein mosaic of Bhindi	03	
2	To stain and study Bacteria (Gram's stain method)	03	
3	To study Oscillatoria: Classification, Thallus, Reproductive structures	03	
4	To study Chara: Classification, Thallus, Apex, Sex organs	03	
5	To study Botrydium: Classification, Thallus, Reproductive structures	03	
6	To study Batrachospermum: Classification, Thallus, Reproductive structures	03	
7	To study Phythium: Classification, Thallus, Reproductive structures	03	
8	To study Pilobolus: Classification, Thallus, Reproductive structures	03	
9	To study Penicillum: Classification, Thallus, Reproductive structures	03	
10	To study Polyporus: Classification, Thallus, Reproductive structures	03	
11	To study White rust of crucifers: Symptoms, causal organism	03	
12	To study Riccia: Classification, Thallus, Anatomy of Thallus, Antheridia, Archegonia and Sporophyte	03	
13	To study Anthoceros: Classification, Thallus, Anatomy of Thallus, Antheridia, Archegonia and Sporophyte	03	
14	To study Equisetum: Classification, External features of plant, Anatomy, Spore producing organs	03	
15	To study Marsilea: Classification, External features of plant, Anatomy, Spore producing organs	03	
Paper 304	<b>SECTION-B Based on theory B-302:</b> <b>Practical study of following types through available Fresh / preserved materials, Permanent slides, charts, and models.</b>		30
1	To study Pinus: Classification, Anatomy, Male –Female cone	03	
2	To study Gnetum: Classification, Anatomy, Male –Female cone	03	
3	To study fossils: Permanent slides / specimens	03	
4	To study leaf apex: Acute, Obtuse, Acuminate, Cuspidate, Emerginate, Cirrhose, Apiculate	03	
5	To study fruits: Legume, Follicle, Siliqua, capsule, Caryopsis, Achene, Nut, Samara, Cremocarp, Carcerulus, Drupe, Pome, Berry, Pepo, Hesperidium, Etaerio of achenes, Etaerio of Follicles, Etaerio of Berries, Sorosis, Syconus	03	
6	To study herbarium techniques for preparation of Herbarium, Computer Herbaria (demonstration)	03	
7	To study family – Anonaceae	03	
8	To study family – Meliaceae	03	
9	To study family – Caesalpiniaceae	03	
10	To study family – Asteraceae	03	
11	To study family – Asclepiadaceae	03	
12	To study family – Bignoniaceae	03	
13	To study family – Verbenaceae	03	
14	To study family – Euphorbiaceae	03	
15	To study family – Commelinaceae	03	



Paper 404	<b>SECTION-C Based on theory B-303:</b> <b>Practical study of following types through available Fresh / preserved materials, Permanent slides, charts, and models.</b>		30
1	To study P.S. showing L.S. of The shoot apex and Root apex	03	
2	To study epidermal tissues: Epidermis	03	
3	To study epidermal tissues: Stomata	03	
4	To study epidermal: Different types of trichomes and hairs	03	
5	To study mechanical Tissue system	03	
6	To study secretary Tissue system: Glands, Nectaries	03	
7	To study secretary Tissue system: Resin and oil ducts	03	
8	To study secretary Tissue system: Laticiferous ducts Hydathodes	03	
9	To study anomalous secondary growth in Nyctanthus stem	03	
10	To study anomalous secondary growth in Boerhavia stem	03	
11	To study anomalous secondary growth in Tinospora and Beet root	03	
12	To study secondary growth in Cucurbita stem	03	
13	To study secondary growth in Capparis stem	03	
14	To study external features of Hydrophytes	03	
15	To study external features of Xerophytes	03	
	<b>TOTAL</b>	<b>135 Hours</b>	

**B.Sc. (BOTANY)****SEMESTER – III****Reference Books:**

- Alexopoulos, C. J.,  
Kumar, H. D.  
Parihar, N. S.  
Sporne, K. K.  
Smith, G. M.  
Kumar & Singh,  
Dube, H.C.  
Chopra, R.N.  
Parihar, N.S.  
Smith, G.M.  
Vashishta, P.C.  
Sporne, K.R.  
Sporne, K.R.  
Chamberlin, C.J.  
Arnold, C.R.  
Delevoryas, T.  
B.R. Vashishta.  
P.C. Vashishta  
Pandey & Trivedi.  
Pandey, Mishra & Trivedi  
Bole, and Vaghani,  
Bilgrami, and Dube,  
Mehrotra, R.S.  
Lawrence, G.H.M.  
Sutaria R.N.  
G. Singh.  
A.K. Mondal,  
A.K. Sharma & R.Sharma,  
N.B.Saxena & S. Saxena,  
Bhojwani and Bhatnagar,  
S.N.Pandey /Ajantha Chadha.  
Maheshwari, P. 1950-  
Esau, K. 1975-  
Fahn, A. 1990 -  
P.D.Sharma  
Subramanyam, Samba Murty  
R.S.Shukla & P.S.Chandel.  
Eugene P. Odum.  
Eugene P. Odum  
Weaver & Clements  
Daubenmire  
Kumar & Bendre
- Introductory Mycology, John Wiley & Sons Inc  
Introductory Phycology. Affiliated East-West Press Ltd., New Delhi  
Bryophyta. Central Book Depot, Allahabad  
The Morphology of Pteridophytes. B. I. Publishing Pvt. Ltd., Bombay  
Cryptogamic Botany Vol. I  
A Text Book of Algae  
An Introduction to Fungi  
Bryophyta  
An Introduction to Embryophyta Vol. I Bryophyta  
Cryptogamic Botany Vol. II  
Pteridophyta  
Morphology of Pteridophytes  
The morphology of gymnosperms  
Morphology of gymnosperms  
An Introduction to Palaeobotany  
Morphology and Evolution of fossil plants  
Botany for Degree students: Algae, Fungi, Bryophyta  
Botany for Degree students: Pteridophyta, Gymnosperms  
A Text Book of Botany :Vol. I  
A Text Book of Botany :Vol. II  
Field Guide to Common Indian Trees  
A text book of modern plant pathology  
Plant Pathology  
Taxonomy of vascular plants  
Systematic Botany  
Plant systematics Oxford and IBH Publishing Co. Pvt. Ltd, New Delhi  
Advanced Plant Taxonomy – New Central Book Agency, Kolkatta  
Taxonomy – Pragati Prakashan, Meerut  
Plant Taxonomy – Pragati Prakashan, Meerut  
The embryology of Angiosperms  
Plant Anatomy & Embryology  
An introduction to the embryology of Angiosperms. Reference Books  
Plant Anatomy  
Plant Anatomy  
Ecology and Environment (7<sup>th</sup> Ed.)  
Ecology –, Narosa Publication House, New Delhi  
A Text Book of Plant Ecology  
Fundamentals of Ecology  
Basic Ecology  
Plant Ecology  
Plant Community  
Practical Botany Vol.1-3



**B.Sc. (BOTANY)**  
**SEMESTER – IV**

Paper No. B-401: Economic Botany, Ethno Botany, Horticulture, Pharmacognosy

**Credit: 03**

**Total Marks: 100**  
**Marks: Semester End Examination: 70**  
**Continues Internal Evaluation: 30**

UNIT	DETAILED SYLLABUS	TEACHING HOURS	MARKS / WEIGHT
Unit – I	<b><u>ECONOMIC BOTANY:</u></b> <b>Pulp and paper industry:</b> - Manufacture of pulp, Manufacture of paper, paper industries in India	03	23
	<b>Natural Rubber</b> ( <i>Hevea brasiliensis</i> ): Rubber plantation in India, Tapering and collection of latex, Raw rubber, Uses of rubber.	03	
	<b>Timber:</b> General account, properties and uses of following plants <i>Tectona</i> (Sag), <i>Dalbergia</i> (Sisam), <i>Adina</i> (Haldarvo), <i>Acacia</i> (Desibaval)	03	
	<b>Food and beverages:</b> - Cereals ( <i>wheat, rice, maize</i> ), - Pulses ( <i>gram, green gram, pea</i> ), - Vegetables ( <i>Onion, Potato, Cabbage, Brinjal, Tomato</i> ) - Beverages ( <i>Tea, Coffee, Cocoa</i> )	03	
	<b>Medicinal Plants:</b> - A brief account of plant drugs and their chief constituents used in medicine. <i>Adhatoda</i> (Ardusi), <i>Ocimum</i> (Tulsi), <i>Widhania</i> (Ashwagandha), <i>Tinospora</i> (Galo), <i>Aloe</i> (Kunvarpathu)	02	
	<b>Plant Fibers:</b> - A brief account of plant fibers <i>Gossypium</i> (Cotton), <i>Cocos</i> (Coir), <i>Crotalaria</i> (Jute)	01	
Unit – II	<b><u>ETHNOBOTANY:</u></b> Introduction	02	24
	Brief account of ethno botanical studies in Gujarat state		
	A Brief account of following important plants: <i>Terminalia chebula</i> , <i>Cassia fistula</i> , <i>Phyllanthus embellica</i> , <i>Azadirachta indica</i> , <i>Madhuca indica</i>	06	
	<b><u>HORTICULTURE:</u></b> General Introduction, definition and scope, utility aspects	03	
	Garden implements and accessories	02	
	Seasonal and perennials growth of Ornamental plants in our locality	02	
Unit – III	<b><u>PHARMACOGNOCY:</u></b> <i>Definition and scope of Pharmacognosy</i>	01	23
	Systematic method of drug study	02	
	Study of following drug plants: Botanical source, family, geographical distribution, chemical constituents and uses		
	a. Carbohydrate and related drugs: Gum Arabic, Bara gokhru	03	
	b. Lipid drugs: Ground nut oil, Sesame oil	03	
	c. Volatile oil drugs: Nilgiri & Sandalwood oil	03	
	d. Tannin drugs: Tanner's cassia(Awal), Chebulic myrobalan (Harde)	03	

**Break up of Continuous Internal Evaluation:**

- |                    |                 |
|--------------------|-----------------|
| 1. Assignments     | 10 Marks        |
| 2. Seminar         | 10 Marks        |
| 3. Test            | <u>10 Marks</u> |
| <b>Total Marks</b> | <b>30 Marks</b> |



Paper No. B-402: Plant Physiology &amp; Plant Biochemistry

Credit: 03

**Total Marks:** 100  
**Marks:** Semester End Examination: 70  
Continues Internal Evaluation: 30

UNIT	DETAILED SYLLABUS	TEACHING HOURS	MARKS / WEIGHT
<b>Unit – I</b>	<b><u>PLANT PHYSIOLOGY:</u></b> <b>Plant cells and water:</b> Translocation of water – Diffusion, Osmosis; Imbibition Plasmolysis <b>Water relations of the whole plant:</b> Transpiration, The ascent of xylem water, Roots, Soil and the uptake of water; Absorption of water by roots	01 02 02 02 02 02 02 02	23
<b>Unit – II</b>	<b><u>PLANT PHYSIOLOGY:</u></b> <b>Plant Movements':</b> Phototropism, Geotropism, Hydrotropism, Chemotropism and their reaction mechanism Seed dormancy Seed germination	02 02 02 02 02 02 03	23
<b>Unit – III</b>	<b><u>PLANT BIOCHEMISTRY:</u></b> <b>Biomolecules – Carbohydrates</b> Structure, Classification Biological importance <b>Enzymes –</b> Chemical nature, Classification, Properties of Enzymes Properties of water and their importance pH	06 05 02 02	24

**Break up of Continuous Internal Evaluation:**

1. Assignments 10 Marks
  2. Seminar 10 Marks
  3. Test 10 Marks
- Total Marks 30 Marks**



Paper No. B-403: Cytology, Genetics, Embryology

**Credit: 03**

**Total Marks: 100**  
**Marks: Semester End Examination: 70**  
**Continues Internal Evaluation: 30**

UNIT	DETAILED SYLLABUS	TEACHING HOURS	MARKS / WEIGHT	
<b>Unit – I</b>	<b><u>CYTOLOGY:</u></b>			
	Structure of prokaryotic and Eukaryotic cell	02	23	
	A typical plant cell	02		
	General account of plant cell	02		
	Ultra structure and functions of Chloroplast	03		
	Ultra structure and functions of Cell wall	03		
Ultra structure, models and functions of Plasma membrane	03			
<b>Unit – II</b>	<b><u>GENETICS:</u></b>		23	
	Mendelism	01		
	Monohybrid Ratio & Dihybrid Ratio	02		
	Interaction of genes: Complementary, Supplementary, Duplicate and epistatic genes, Multiple alleles in plants	04		
	<b><u>BIOSTATISTICS:</u></b>			
	Introduction: Sampling methods in biological experiments, concept, analysis and applications	01		
	Methods of presentation of data: Tables, diagrams & graphs, Frequency distribution	01		
	Measures of central tendency: Mean median & mode for raw data & for frequency table	02 02		
Probability	02			
<b>Unit – III</b>	<b><u>EMBRYOLOGY:</u></b>		24	
	Structure of anther,	01		
	Microsporogenesis,	01		
	Formation of pollen grains. (Male gametophyte)	01		
	Pollen germination, Pollen tube growth	01		
	Structure of Pistil,	01		
	Megasporogenesis,	01		
	embryo sac and its types (Female gametophyte)	03		
	Pollination,	01		
	Fertilization	01		
	Double fertilization	01		
Apomixes	01			
Development of endosperm and embryo in Monocots and dicots	02			

**Break up of Continuous Internal Evaluation:**

1. Assignments	10 Marks
2. Seminar	10 Marks
3. Test	10 Marks
<b>Total Marks</b>	<b>30 Marks</b>



Paper No. B-404: Practicals

Credit: 09

Total Marks: 90 (External Only)

UNIT	DETAILED SYLLABUS	TEACHING HOURS	MARKS / WEIGHT
Paper 304	<b>SECTION-A Based on theory B-401</b> <b>Practical study of following types through available Fresh / preserved materials, Permanent slides, charts, and models.</b>		30
1	To study economic botany of Paper and Rubber.	03	
2	To study Timber: Sag, Sisam, Haldarvo, Desi baval	03	
3	To study economic botany of Cereals: <i>wheat, rice, maize</i>	03	
4	To study economic botany of Pulses: <i>gram, green gram, pea</i>	03	
5	To study economic botany of Vegetables: <i>Onion, potato, cabbage, Brinjal, Tomato.</i>	03	
6	To study economic botany of beverages: <i>Tea, Coffee, Cocoa</i>	03	
7	To study economic botany of Plant Fibers: Cotton, Coir and Jute	03	
8	To study economic botany Medicinal plants: Ardusi, Tulsi, Galo, Ashwagandha, Kunvarpathu	03	
9	To study Ethno botanical importance of plants: Harde, Garmalo, Ambla, Limdo, Mahudo	03	
10	To study about botanical name, source, family, chemical constituents and uses of Carbohydrate and related drugs: Gum Arabic, Bara gokhru	03	
11	To study about botanical name, source, family, chemical constituents and uses of Lipid drugs: Ground nut oil, Sesame oil	03	
12	To study about botanical name, source, family, chemical constituents and uses of Volatile oil drugs: Nilgiri & Sandalwood oil	03	
13	To study about botanical name, source, family, chemical constituents and uses of Tannin Drugs: Tanner's cassia(Awal), Chebulic myrobalan (Harde)	03	
14	To study methods for garden implements, maintenance and its accessories	03	
15	To prepare a list of plants used as ornamental plants with seasonal and perennials growth in our locality	03	
Paper 304	<b>SECTION-B Based on theory B-402:</b> <b>Practical study of following types through available Fresh / preserved materials, Permanent slides, charts, and models.</b>		30
1	Experiment of osmosis by using potato osmometer	03	
2	Experiment of Exosmosis and Endosmosis in Grapes	03	
3	Experiment that indicate diffusion	03	
4	Experiment that indicate ascent of sap takes place through the xylem by ringing method	03	
5	To study Plasmolysis experiment in Tradescantia leaf	03	
6	To demonstrate the stomatal & cuticular transpiration by four leaves methods	03	
7	To demonstrate the rate of transpiration by using ganong potometer	03	
8	To demonstrate Phototropism	03	
9	To demonstrate geotropism by clinostat	03	
10	To perform the Carbohydrate test	03	



11	To study pH from Lemon juice, Soil and KOH Solution	03	
12	Histochemical test for Glucose	03	
13	Histochemical test for Starch	03	
14	To test the activity of amylase in plant tissue.	03	
15	To study water analysis	03	
Paper 304	<b><u>SECTION-C Based on theory B – 403:</u></b> <b>Practical study of following types through available Fresh / preserved materials, Permanent slides, charts, and models.</b>		30
1	To study of electron micrograph of typical plant cell	03	
2	To study of electron micrograph of Chloroplast	03	
3	To study models of Plasma membrane	03	
4	Examples of Genetics	03	
5	Examples of Genetics	03	
6	Examples of Mean, Median and Mode	03	
7	Examples of Probability	03	
8	To study structure of anther	03	
9	To study pollen grains	03	
10	To study pollen germination	03	
11	To study Permanent slides Ovules	03	
12	To study Permanent slides embryo sac	03	
13	To study Permanent slides and mounting of embryo in Monocots	03	
14	To study Permanent slides and mounting of embryo in Dicots	03	
15	Field study /Excursion / Tour Report		
	<b>TOTAL</b>	<b>135 Hours</b>	

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B.P. Pandey: Economic Botany – Chand & Co., New Delhi  
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Kumar, H.D. - Molecular biology and biotechnology.  
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Witham et al. Experiments in Plant Physiology. V N Renhold Company, New York.  
P. K. Gupta, Genetics. Rastogi Publications. Shivaji Road Meerut, India  
Atherly A. G. et al. The Science of Genetics –1999  
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Pawar C.B. Genetics- (Vol I & II).  
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Hans-Walter Heldt, 2004, Plant Biochemistry Academic Press.  
Bob Buchanan, et al. Biochemistry and Molecular Biology of Plants  
P.J. Lea & R.C. Leegood: Plant Biochemistry & Molecular Biology –John Wiley & Sons.  
Lehninger, A.L. Principles of Biochemistry, CBS Publishers & Distributors  
Lewin, B. (2003). Genes, VII, John Wiley & Sons.  
DeRobertis: Cell and molecular biology, 1987: Lee and Febiger, Washington.  
Kumar & Bendre: Practical Botany Vol.1-3