

Academic Council: Date 26 / 04 / 2010, R. No.: (2)
Executive Council: Date 07 / 05 / 2010, R. No.: (3)

BHAVNAGAR UNIVERSITY

BHAVNAGAR

(NACC Accreditation Grade “B”)

CREDIT AND SEMESTER SYSTEM SYLLABUS

B.Sc.

BIOLOGY

(In Force From Academic Year: 2010-2011)

तमसो मा ज्योतिर्गमय



DETAILED CURRICULUM F. Y. B. Sc. BIOLOGY
Effective from June – 2010

SEMESTER PATTERN :

- The Course content has been designed on **Semester pattern**.
- The workload for Theory & Practicals is given on Semester pattern.
- There shall be **02 Theory paper** [100 marks(70 marks external+30marks internal) and 02 Hours duration each] ;
- Biology Practical Examination of **100 marks** [70 marks (35 marks for Botany and 35 marks for Zoology) and **04 hours duration** (2hours for Botany and 2 hours for Zoology)+30 marks internal(15 marks for Botany and 15 marks for Zoology) in University Examination.
- There shall be **Two Semester** in Academic Year. (Semester-1 & 2)

SEMESTER-I

SR. NO.	PAPER NO.	NAME OF THE PAPER	TOTAL MARKS EXT.+INT*= TOTAL	PASSING STANDARAD EXT.+INT = TOTAL	TOTAL TEACHING HOURS	EXAM HOURS	CREDITS
1	1	Paper B – 101 Botany	70+30=100	28+12=40	15 WEEKS X 3 HOURS =45	02	03
2	2	Paper B – 102 Zoology	70+30=100	28+12=40	15 WEEKS X 3 HOURS =45	02	03
3	3	Paper B – 103 Biology practical (Botany & Zoology)	60	24	15 WEEKS X 3 HOURS =45 BOTANY 15 WEEKS X 3 HOURS = 45 ZOOLOGY	04 Hours & 30 Min.	06

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



Detailed Syllabus

B.Sc. Biology

Year: First

Semester: 1

Paper No: B-101

Title of Paper: PLANT DIVERSITY , BACTERIA & CRYPTOGAMES

Credits: 3

Marks: 100

Marks: Semester end Examination:

Marks

70 Marks

Continuous Internal Evaluation:

30 Marks

Unit	Detailed syllabus	Teaching Hours	Marks/weight
Unit-1	<p>Diversity and Classification of the plant kingdom :</p> <p>Classification of kingdom and the criteria. (According to Mayr, the seven kingdom of living organism.); Diversity in habitat ,form , life span, Nutrition and Ecological status of Plants.</p> <p>Cynobacteria : General account of Cynobacteria. Study of life history and economic importance of blue-green algae : <i>Spirulina</i> .</p> <p>Algae :</p> <p>Classification (As per F.E.Fristch), life history and economic importance of : <i>Volvox</i> , Classification (As per F.E.Fristch), life history and economic importance of : <i>Spirogyra</i> . Classification (As per F.E.Fristch), life history and economic importance of : <i>Oedogonium</i> , Classification (As per F.E.Fristch), life history and economic importance of : <i>Ectocarpus</i> .</p>	1 1 1 3 3 3 3	23
Unit-2	<p>Bacteria: Structure ,types ,nutrition of Bacteria. , Reproduction and economic importance of <i>Bacteria</i></p> <p>Fungi : Classification (As per Ainsworth) ,life history and economic importance of Mastigomycotina : <i>Phytophthora</i> , Classification (As per Ainsworth) ,life history and economic importance of Zygomycotina : <i>Mucor</i> , Classification (As per Ainsworth) ,life history and economic importance of Ascomycotina : <i>Saccharomyces (Yeast)</i></p> <p>General account of Plant Pathology.</p> <p>Antibiotics.</p> <p>Lichens: General account of lichens .</p>	2 2 2 2 2 1 1 2	23



Unit-3	<p>Bryophytes : Classification (As per G.M.Smith), anatomy , reproduction , life history , alternation of generation of following .(Developments of organs are excluded.) Hepaticae : <i>Marchantia</i> .</p> <p>Classification (As per G.M.Smith), anatomy , reproduction , life history , alternation of generation of following .(Developments of organs are excluded.) Musci : <i>Funaria (Moss)</i>.</p> <p>Pteridothytes: Classification (As per G.M.Smith), anatomy , reproduction , life history , alternation of generation of following .(Developments of organs are excluded.) Lepidophyta : <u><i>Selaginella</i></u> .</p> <p>Classification (As per G.M.Smith), anatomy , reproduction , life history , alternation of generation of following .(Developments of organs are excluded.) Pterophyta : <u><i>Nephrolepis (Fern)</i></u>.</p>	4 4 4 4	24
--------	---	------------------------------	----



DETAILED CURRICULUM F. Y. B. Sc. BIOLOGY
Effective from June – 2010

Detailed syllabus

B.Sc.

Year: First

Semester: 1

Paper No: 02

Title of the Paper: Diversity of Life, Genes & Heredity, Cytology & Applied Zoology B-102
(Zoology).

Credits: 03

Marks: 100

Marks: Semester End Examination: **70Marks**

Continous Internal Evaluation: **30 Marks**

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit 1	<p>Diversity of Life Classification of the following animals up to the classes: 1.1 Classification of Protozoa with example. 1.2 Classification of Porifera with example. 1.3 Classification of Coelenterata with example. 1.4 Classification of Platyhelmenthes with example. 1.5 Classification of Nematelminthes with example. 1.6 Classification of Annelida with example. 1.7 Classification of Arthropoda with example. 1.8 Classification of Echinodermata with example. 1.9 General Morphology and functional anatomy of the Following animal: Earth Warm: External character. Body Wall, Digestive system, Reproductive system, Nervous systems, Septal Nephridia, Blood Gland, Setae.</p>	01 01 01 01 01 01 01 01 01 01 07	24
Unit 2	<p>Genes & Heredity: 2.1 Mendel's mono and dihybrid ratio & Laws of heredity. 2.2 CO-dominance (e.g. Roan cattle & Blue Birds). 2.3 Epistasis (9:3:4 ratio). 2.4 ABO blood group & Rh factor. 2.5 Recombinant DNA & GENE splicing (Introduction). 2.6 Lethal genes (E.g. Yellow Mice, Sickle Cell anemia).</p> <p>Cytology: 2.1 General idea of prokaryotic and eukaryotic cells. 2.2 Ultramicroscopic structure of an animal cell. 2.3 Cell cycle and cell division.</p>	01 01 01 01 01 01 01 02 02	23



	2.4 Endoplasmic reticulum and Golgi apparatus, synthesis and packaging. 2.5 Cell defense system – Lysosome. 2.6 Energy producing system – Mitochondria. 2.7 Nucleus.	01 01 01 01	
Unit 3	Applied Zoology 3.1 Biological method of pest control 3.2. Hazards of Chemical Pesticides. 3.3. Population explosion and importance of fisheries 3.4 Bioculture: a. Apiculture : Indigenous method, Modern Method Benefits and Drawbacks. b. Poultry : Poultry Breeds, Methods of Poultry Farming and Poultry apparatus 3.5. Artificial insemination in cattle 3.6. Environmental pollution A brief account of : (a) Air pollution (b) Water pollution (c) Soil pollution (d) Noise pollution	01 01 02 03 03 01 04	23



DETAILED CURRICULUM
F.Y. B.Sc. (BIOLOGY)

Effective from June – 2010

Semester: 1

Paper No: 03

Title of the Paper: Biology Paper (Practical) B-103 (Botany & Zoology).

Credits: **06**

Marks: 60

DETAILED CURRICULUM FOR PRACTICAL [Based on paper B- 101&102]

Dissection is not performed in ref. to: UGC's D.O. Letter No.:F.1-80/2006 (Secu) dated:31/10/06

All the topics of the practicals are being taught by Models, Charts, Figures and Slides.

Study of living animals dissections are replaced by Computer Animation/Chart/Model study in response to UGC guide line in ref. to removal of dissections.

Students will have to prepare their Practical journals for Botany & Zoology in Laboratory work and they will have to submit certified journals in the University practical exam. Students are not allowed in the laboratory without certified journals in the University practical examination. There shall be Local Excursion/Environment Camp for Protection of Forest & Environment awareness and conservation of Biodiversity.

Unit	Detailed syllabus for Botany practical	Teaching Hours	Marks/weight
	<u>Study of following types through fresh / preserved materials, charts and permanent slides</u>		
	Practical – 1 Study of Bacteria – types (Permanent slides)	03	
	Practical – 2 Study of Spirulina. (Study of structure & reproduction)	03	
	Practical – 3 Study of Volvox. (Study of structure & reproduction)	03	
	Practical – 4 Study of Spirogyra.(Study of structure & reproduction)	03	
	Practical – 5 Study of Oedogonium.(Study of structure & reproduction)	03	
	Practical –6 Study of Volvox.(Study of structure & reproduction)	03	
	Practical –7 Study of Ectocarpus.(Study of structure & reproduction)	03	
	Practical –8 Study of Phytophthora.(Study of structure & reproduction)	03	
	Practical –9 Study of Mucor.(Study of structure & reproduction)	03	
	Practical –10 Study of Saccharomyces (Yeast) (Study of structure & reproduction)	03	
	Practical –11 Study of lichens.	03	
	Practical –12 Study of morphology, anatomy, reproduction of Marchantia.	03	
	Practical –13 Study of morphology, anatomy, reproduction of Funaria (Moss)	03	
	Practical –14 Study of morphology, anatomy, reproduction of Selaginella.	03	
	Practical –15 Study of morphology, anatomy, reproduction of Nephrolepis (Fern).	03	



Unit	Detailed syllabus for Zoology practical	Teaching Hours	Marks/weight
	<u>Classification of the following animals up to the classes:</u>		
	Practical – 1 Classification of Phylum Protozoa and Porifera. Protozoa: Amoeba, paramecium, euglena, Plasmodium. Porifera: Grantia, leucosolenia.	03	
	Practical–2 Classification of Phylum Coelenterata to Platyhelmenthes. Coelenterata: Hydra, Sea-anemone, Jelly fish, Gorgonia, Coral. Platyhelmenthes: Liver fluke, Planaria, Tapeworm.	03	
	Practical-3 Classifications of Phylum Nematelminthes to Annelida. Nematelminthes: Guinea worm, Ascaris(Male & Female) Annelida: Neries, Earthworm, Leech	03	
	Practical - 4 Classification of Phylum Arthropoda. Arthropoda: Paripatus, Crab, Prawn, Centipede, Millipede, Bed bug, Grass hopper, Scorpion, Tick.	03	
	Practical - 5 Classification of Phylum Mollusca to Echinodermata. Mollusca: Chiton, Pila, Unio, Pearl oyster, Sepia, Dentalium. Echinodermata: Brittle star, Sea cucumber, Sea- lily, Sea-urchin.	03	
	Practical-6 Study of External characters of Earthworm.	03	
	Practical-7 Study of Digestive system of Earthworm.	03	
	Practical-8 Study of Reproductive system of Earth worm.	03	
	Practical-9 Study of Nervous system of Earth worm.	03	
	Practical-10 Study of Temporary mountings of ovary, Blood glands, setae and Septal Nephridia of Earth worm by permanent slides, charts, models and Multimedia.	03	
	Practical-11 Study of ABO blood group and Rh factors.	03	
	Practical-12 Different stages in mitosis by plant tissue.	03	
	Practical-13 Study of human Blood cell (RBC, WBC and Platelets).	03	
	Practical-14 Study of various types of poultry breeds.	03	
	Practical-15 Study of various types of poultry houses.	03	



SEMESTER-II

SR. NO.	PAPER NO.	NAME OF THE PAPER	TOTAL MARKS EXT.+INT*= TOTAL	PASSING STANDARAD EXT.+INT = TOTAL	TOTAL TEACHING HOURS	EXAM HOURS	CREDITS
1	4	Paper B – 201 Botany	70+30=100	28+12=40	15 WEEKS X 3 HOURS =45	02	03
2	5	Paper B – 202 Zoology	70+30=100	28+12=40	15 WEEKS X 3 HOURS =45	02	03
3	6	Paper B – 203 Biology practical(Botany& Zoology)	(External Only) 60	24	15 WEEKS X 3 HOURS =45 BOTANY 15 WEEKS X 3 HOURS = 45 ZOOLOGY	04 Hours & 30 Min.	06

*INTERNAL MARKS

ASSIGNMENT 10

TEST 10

SEMINAR 10



DETAILED CURRICULUM F. Y. B. Sc. BIOLOGY

Effective from June – 2010

B.Sc. Biology

Year: First

Semester:2

Paper No:B-203

Title of Paper: **PHAENEROGAMES, SYSTEMATIC BOTANY, PHYTOGEOGRAPHY, PLANT ANATOMY, BIOTECHNOLOGY** **Credits:3**

Marks: 100 Marks

Marks: Semester end Examination: 70 Marks

Continuous Internal Evaluation: 30 Marks

Unit	Detailed syllabus	Teaching Hours	Marks/weight
Unit-1	<p>Gymnosperms: Classification (As per Chamberlain), anatomy , reproduction , life history alternation of generation of following. (Developments of organs are excluded.)Cycadales : <i>Cycas</i></p> <p>Angiosperms: life history & alternation of generation in Sunflower. Differences between Angiosperm & Gymnosperm.</p> <p>Morphology: Important characters of the following vegetative and reproductive structure of plants which are useful in Plant taxonomy ; Morphology of The leaf (leaf shape, Venation , Phyllotaxy, Simple and compound leaves, Stipules) ; Inflorescence ; Flower(Calyx,Corolla,Androecium,Gyneocium); Placentation .</p>	3 2 1 5 1 3	23
Unit-2	<p>Angiosperms: Study of families: Classification according to Bentham & Hooker's classification system . General characters , floral structure , floral formula , floral diagram and common examples of economic and ethnobotanical important plants .</p> <p>Families: 1. <i>Malvaceae</i> 2. <i>Papilionaceae</i> 3. <i>Rubiaceae</i>. 4. <i>Apocynaceae</i>. 5. <i>Nyctaginaceae</i>. 6. <i>Amaryllidaceae</i></p> <p>Phytogeography: General principles , Vegetation of Gujarat state , Forest types of Gujarat state , Conservation of forests.</p>	2 1 1 1 1 1 1 1 2 2 2	24



Unit-3	<p>Plant Anatomy: Secondary growth in <i>Sunflower</i> root ; Secondary growth in <i>Sunflower</i> stem. Anomalous secondary growth in <i>Amaranthus</i> stem. Stomata – Structure & Types.</p> <p>Biotechnology: Basic aspects of plant tissue culture techniques , Genetic engineering of plants , Salient achievement in crop biotechnology (with suitable examples) and prospects.</p>	3 2 2 2 2 2 2	23
--------	--	-------------------------------------	----



DETAILED CURRICULUM F. Y. B. Sc. BIOLOGY

Detailed syllabus

B.Sc.

Year: First

Semester: 2

Paper No: 2

Title of the Paper: **Diversity of Life, Tissue system of mammals, Pathology, Environmental Biology, Evolution B-202(Zoology).**

Credits: 03

Marks: 100

Marks: Semester End Examination: **70Marks**

Continous Internal Evaluation: **30 Marks**

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit 1	Diversity of Life 1.1 Classification of Protochordata up to classes with example. 1.2 Classification of Chordata up to sub classes with example. 1.3 General Morphology and functional anatomy of the following animal. Hydra: a. Structure of body wall. b. Different methods of locomotion. c. Different methods of Reproduction. d. Cnecoblast of Hydra	03 05 02 02 02 01	23
Unit.2.	Study of mammalian Tissue system. Structure of the following : 2.1 Stomach, 2.2 Intestine, 2.3 Liver, 2.4 Pancreas, 2.5 Kidney 2.6 structure of Cardiac muscles 2.7 Physiological properties of Cardiac muscles. Animal Pathology and Diseases causing protozoans 2.1 Plasmodium 2.2 Trypanosoma 2.3 Entamoeba Diseases causing Nematodes and Platyhelmenthes. 2.1 Tape worm 2.2 Guinea worm 2.3 Filaria worm	09 03 03	24



Unit.3.	Environmental Biology		23
	3.1 Limiting factors of environment	01	
	3.2 Aquatic and terrestrial habitats	04	
	3.3 General concept of Biodiversity of Gujarat and its conservation measures.	02	
	3.4 Brief account of the followings adaptation	03	
	I. Terrestrial, II. Aquatic, III. Arboreal, IV. Fossorial (Borrowings), V. Volant.		
	Evolution		
	3.1 Historical aspects of the followings evolutionary theory:	05	
	1. Greek theory		
	2. Pre-modern theory		
	3. Modern theory: (a) Lamarckism (b) Darwinism (c) Wiseman's theory of germplasm (d) Theory of mutation (e) Modern -synthetic theory		



Paper No:06

Title of the Paper: Biology Paper (Practical) B-201 (Botany&Zoology).
Marks: 60

Credits: **06**

DETAILED CURRICULUM FOR PRACTICAL [Based on paper B-104&105]

Dissection is not performed in ref. to: UGC's D.O. Letter No.:F.1-80/2006(Secu) dated:31/10/06
All the topics of the practicals are being taught by Models, Charts, Figures and Slides and multimedia.

Study of living animals dissections are replaced by Computer Animation/Chart/Model study in response to UGC guide line in ref. to removal of dissections.

Students will have to prepare their Practical journals for Botany & Zoology in Laboratory work and they will have to submit certified journals in the University practical exam. Students are not allowed in the laboratory without certified journals in the University practical examination. There shall be Local Excursion/Environment Camp for Protection of Forest & Environment awareness and conservation of Biodiversity.

Unit	Detailed syllabus for Botany	Teaching Hours	Marks/ weight
	<p><u>Study of following types through fresh / preserved materials, charts and permanent slides</u> <u>LABORATORY PRACTICALS</u></p> <p>Practical-1 Study of Leaf shape: Linear (Maize/Grass), Lanceolate (Nerium), Ovate (Hibiscus), Oblong (Banana), Reniform, (Merremia / Hydrocotyle), Cordate (Betel /Tinospora), Acicular (Pinus / Casurina) Study of Leaf Venation: Vinca, Zizyphus, Castor, Canna, Grass/Maize, Fan-palm.</p> <p>Practical-2 Study of Leaf Phyllotaxy: Anona, Citrus, Ficus, Calotropis, Quisqualis, Nerium, Acalypha. Study of Stipules: Free lateral- Hibiscus, Adnate - Rose, Interpetiolar-Ixora, Intrapetiolar-Tabernaemontana, Ochreate- Polygonum.</p> <p>Practical-3 Study of Simple & Compound leaves: Hibiscus, Rose, Cassia fistula (Garmalo), Delonix (Gulmohr, Moringa (Saragavo), Citrus, Balanites (Ingorio), Aegle(Bili), Marselia, Bombax (Shimlo)</p> <p>Practical-4. Study of Inflorescence ; Raceme-Galtoro, Spike-Quisqualis, Capitulate-Leucaena/Mimosa. Capitulum-Tridax / Sunflower, Umbel- Onion, Solitary-Hibiscus, Datura; Biparous cyme -Jasmine, Multiparous cyme-Nerium, Cyathium-Euphorbia Hypanthodium-Ficus</p> <p>Practical-5. Study of Flower -1 : Calyx-Mustard,Hibiscus. Corolla- Hibiscus,Bean, Ixora, Ocimum. Perianth -Tuberose, Bougainvillea. Aestivum: Hibiscus (Sepals & Petals), Cassia (Sepals & Petals), Bean (Petals). Study of Flower - 2: Androecium- Hibiscus, Pea, bombax, Gynoecium-Bean, Rose, Hibiscus. Placentation: Marginal , Axile, Basal Ovary: Superior (Hibiscus), Inferior (Ixora/Cucurbita).</p> <p>Practical-6 Study of family : Malvaceae*.</p>	<p>3</p> <p>3</p> <p>3</p> <p>3</p> <p>3</p>	



Practical-7 Study of family : Papilionaceae*.	3	
Practical-8 Study of family : Rubiaceae*.	3	
Practical-9 Study of family : Apocynaceae*.	3	
Practical-10 Study of family : Nyctaginaceae*.	3	
Practical-11 Study of family : Amaryllidaceae*.	3	
Practical-12 Study of Morphology, anatomy, reproduction of Cycas.	3	
Practical-13(a) Study of Secondary growth in Sunflower root(T.S.).	3	
Practical-13(b) Study of Secondary growth in Sunflower stem(T.S.).	3	
Practical-14 Study of Anomalous Secondary growth in Amaranthus stem. (T.S.).	3	
Practical-15 Study of Stomata in leaf. (from leaf surface)	3	
=====		
<i>* (Teachers may select One plant species available common in their localities.)</i>		

Unit	Detailed Syllabus for Zoology	Teaching Hours	Marks/Weight
Unit 1	Classification of the following animals. Practical-1 Classification of Protochordata to Pisces: Protochordata: Acidia, Amphioxus, Balanoglossus, Lamprey Pisces: Scoliodon, Electric ray, Eel (up to sub class) Ophiocephalus, Sea horse Practical-2 Classification of Amphibia to Reptiles up to the Sub classes: Amphibia: Ichthiophis, Toad, Salamander Reptiles: Chameleon, Tortoise, Cobra, Krait, Viper, Alligator, Calotes Practical-3 Classification of Aves to Mammals up to the sub classes: Aves: Kingfisher, Hoopoe, Owl, Crow, Myna, Sparrow. Mammals: Rabbit, Bat, Hedge hog, Rat. Practical-4 Study of life history of Amoeba and Paramecium. Practical-5 Study of life history of Hydra and Liver fluke.	03 03 03 03 03	
Unit 2	Practical-6 Study of Lifecycle and mouth parts of Anopheles. Practical-7 Study of Lifecycle and mouth parts of Culex. Practical-8 Study of pathogenic Protozoans 1. Iasmodium 2. Trypanosome 3. Entamoeba Practical-9 Study of pathogenic Platyhelmenthes & Nematodes. 1. Tape Worm 2. Guinea worm 3. Filaria worm Practical-10 Histological studies of the followings, mammalian tissues with the help of permanent slides: 1. Stomach. 2. Intestine. 3. Liver.	03 03 03 03 03	
Unit 3	Practical-11 Histological studies of the followings, mammalian tissues with the help of permanent slides: 1. Pancreas.	03	



Botany Department , Sir P. P. Institute of Science.

SUGGESTED READINGS

Smith ,G.M.1971 .	CRYPTOGAMIC BOTANY. Vol 1. (Algae & Fungi)
Smith ,G.M.1971.	CRYPTOGAMIC BOTANY. Vol 2. (Bryophyta & Pteridophyta)
Vasishtha ,B . R .	BOTANY FOR DEGREE STUDENTS : ALGAE.
Vasishtha, B . R .	BOTANY FOR DEGREE STUDENTS : FUNGI.
Dubey, H.C.	BACTERIA , VIRUSES AND FUNGI.
Dubey, H.C.	AN INTRODUCTION TO FUNGI.
Vasishtha, B . R .	BOTANY FOR DEGREE STUDENTS : BRYOPHYTES.
Vasishtha, P . C .	BOTANY FOR DEGREE STUDENTS : PTERIDOPHYTES.
Vasishtha P . C .	BOTANY FOR DEGREE STUDENTS : GYMNOSPERMS.
Gangulee, Das &, Dutta.	COLLEGE BOTANY Vol I.
Gangulee.H.C. & Kar ,A.K.	COLLEGE BOTANY Vol II.
S.K.Mukherji	COLLEGE BOTANY Vol III.
Dutta ,A.C.	BOTANY : FOR DEGREE STUDENTS.
Sutaria, R. N.	SYSTEMATIC BOTANY.
Pandey, B. P.	PLANT ANATOMY.
Bhatt ,D.C.& Mitaliya ,K.D.	TEXTBOOK OF ANGIOSPERM TAXONOMY.
Ramawat , K.G.	PLANT BIOTECHNOLOGY.
Sharma , P.D.	ECOLOGY & ENVIRONMENT.
Kumar & Bendre	PRACTICAL BOTANY : Vol . I & Vol. II .
પુંજાણી , બી .એલ.	લીલ , કુગ અને લાર્ઈકેન્સ.
ચાંદુરકર , પી .જે .	વનસ્પતિ અંતસ્થ રચના.
વેધ , બી . એસ .	વનસ્પતિ ભુગોળ.
જોષી , જે. વી .	આવૃત બીજધારી વનસ્પતિના કુળો.
શાહ , જી.એલ.	વનસ્પતિ વર્ગીકરણ ભાગ - ૧.
શાહ , સી. કે .	વનસ્પતિ વર્ગીકરણ ભાગ - ૨.
ઉદવાડિયા અને પરીખ .	દ્વિઅંગી વનસ્પતિ ઓ.
ઉદવાડિયા અને પરીખ .	ત્રિઅંગી વનસ્પતિ ઓ.
ભટ્ટ, ડી. સી.	પ્રથમ વર્ષે બી.એસસી વનસ્પતિશાસ્ત્ર.
ભટ્ટ, ડી. સી. અને એસ.કે.મહેતા	દ્વિતીય વર્ષે બી.એસસી વનસ્પતિશાસ્ત્ર.
નીરવ પ્રકાશન	પ્રથમ વર્ષે બી.એસસી . જીવવિજ્ઞાન - ૧ .
રવિ પ્રકાશન	પ્રથમ વર્ષે બી.એસસી . જીવવિજ્ઞાન - ૧ .