

**VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT.
SYLLABUS FOR F.Y B.Sc.
BOTANY
Effective from July – 2011**

SEMESTER - I

BOT - 101 : Morphology, Diversity Of Lower Cryptogames & Food Plants
BOT - 102 : Plant Resources, Nursery & Weed management, Diversity Of Higher
Cryptogams
BOT - 101 Practical based on Bot-101
BOT - 102 Practical based on Bot-102

SEMESTER - II

BOT - 203 : Plant Physiology, Plant Ecology, Anatomy And Medicinal Plants
BOT - 204 : Diversity Of Phanerogames, Herbal Cosmetics, Human Affairs And Plant
Diseases
BOT - 203 Practical based on Bot-203
BOT - 204 Practical based on Bot-204

VEER NARMAD SOUTH GUJARAT UNIVERSITY , SURAT.

SYLLABUS FOR F.Y B.Sc.

BOTANY PAPER-101

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SEMESTER - I

BOT – 101 : Morphology, Diversity Of Lower Cryptogames & Food Plants

UNIT: I - MORPHOLOGY

- (1) Phyllotaxy: Definition and Types with examples.
- (2) Aestivation: Definition and types with examples.
- (3) Inflorescence: Definition and Types: Racemose and Cymose
- (4) Placentation: Definition and Types with examples.

UNIT: II - ALGAE

Study of life history of *Spirogyra* and *Hydrodictyon*

- (i) Systematic position
- (ii) Habit and Habitat
- (iii) External morphology
- (iv) Reproduction

UNIT: III - FUNGI

Study of life history of *Mucor* and *Phytophthora*

- (i) Systematic position
- (ii) Habit and Habitat
- (iii) External morphology
- (iv) Reproduction

UNIT: IV - FOOD PLANTS

Brief account and usage of the following:

- (i) Jowar
- (ii) Gram
- (iii) Pea
- (iv) Mustard

VEER NARMAD SOUTH GUJARAT UNIVERSITY , SURAT.
SYLLABUS FOR F.Y B.Sc.
BOTANY PAPER-102
Effective from July – 2011
SEMESTER - I

BOT -102 : Plant Resources, Nursery & Weed management, Diversity Of Higher Cryptogams

UNIT: I - PLANT RESOURCES , MANAGEMENT AND UTILIZATION

Introduction, natural resources, biological resources, plant as natural resources, Bioenergy, food, fodder, fibre, medicine and essences

UNIT: II - NURSERY MANAGEMENT

Introduction, types of nurseries and cultural practices

Seed (propagule) collection, selection of propagule materials, storage and treatment

Manures, fertilizers and pesticides

Methods of irrigation- Drip, sprinkler and flood

UNIT: III - WEED MANAGEMENT

Introduction and need

Invasive weeds-concept and causes of their dominance

Weed control- physical, chemical and biological methods

Sustainable use of weeds.

UNIT: IV - HIGHER CRYPTOGAMS

(A) BRYOPHYTA

Study of life history of *Funaria* and *Riccia*

(i) Systematic position

(ii) Habit and Habitat

(iii) External and internal structure

(iv) Reproduction

(4) PTERIDOPHYTA

Study of life history of *Nephrolepis*

- (i) Systematic position
- (ii) Habit and Habitat
- (iii) External and internal structure
- (iv) Reproduction
- (v) Alternation of generation

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SYLLABUS FOR F.Y B.Sc.

BIOLOGY PRACTICAL - I (BOTANY)

BOT : 101 Practical based on BOT : 101 (Theory)

Effective from July – 2011

SEMESTER – I

The candidates should study the typical vegetation in natural condition and should record their observation in journals. Excursion should be arranged during the year to local places. Every candidate shall complete laboratory course in accordance with the regulations issued from time to time by Academic Council on the recommendation of the Board of Studies. Every candidate shall record observation directly in the laboratory journal. Every journal shall be signed periodically. At the end the semester candidate shall produce certified journals at the practical examination.

(A) MORPHOLOGY

(1) Phyllotaxy:

- (i) Distichous phyllotaxy
- (ii) Tristichous
- (iii) Pentastichous
- (iv) Opposite superpose
- (v) Opposite decussate
- (vi) Verticillate or Whorled
- (vii) Leaf mosaic
- (viii) Heterophylly

(2) Aestivation.

- (i) Circular
 - (a) Valvate: Calyx of *Hibiscus rosasinensis*
 - (b) Twisted: Corolla of *Hibiscus rosasinensis*
- (ii) Spiral
 - (a) Imbricate: Corolla of *Caesalpinia pulcherrima*
 - (b) Quincuncial : Corolla of *Antigonon leptopus*
 - (c) Vexillary : Corolla of *Clitoria ternatea*

(3) Inflorescence:

- (i) **RACEMOSE**
 - (a) Raceme: *Caesalpinia pulcherrima*, *Brassica juncea*
 - (b) Spike: *Achyranthus aspera*, *Polianthes tuberosa*
 - (c) Spadix: *Colocasia*
 - (d) Catkin: *Acalypha hispida*
 - (e) Spikelets: Poaceae (any plant)
 - (f) Corymb: *Cassia*, *Ixora*
 - (g) Umbel: *Coriandrum*
 - (h) Capitulate: *Acacia*, *Albizia*
 - (i) Capitulum: *Helianthus*, *Tridax*

(ii) **CYMOSE**

Unbranched:

- (a) Solitary Terminal: *Datura*
- (b) Solitary Axillary: *Hibiscus*

Branched:

(c) Helicoid: Hamelia

(d) Scorpioid: Heliotropium

(e) Dichasial or Biparous: Clerodendrum, Nyctanthus, Jasminum

(f) Polychasial or Multiparous: Nerium, Calotropis

(4) Placentation

Study of Placentation to be demonstrated by permanent slides.

(i) Marginal

(ii) Axil

(iii) Free central

(iv) Parietal

(v) Superficial

(vi) Basal

(B) CRYPTOGAMES

(1) *Spirogyra*

To study the thallus structure and reproduction (Scalariform and Lateral conjugation).

(Permanent slides of thallus W.M, Scalariform conjugation, Lateral Conjugation.)

(2) *Hydrodictyon*

To study the thallus structure and reproductive structure

(Permanent slides of thallus W.M)

(3) *Mucor* :

To study the thallus structure and reproductive structure. Permanent slides of *Mucor* vegetative W.M. *Mucor* sporangia, *Mucor* Zygosporangium.

(4) *Phytophthora*

To study the thallus structure and reproductive structure.

(Permanent slides of *Phytophthora* vegetative W.M. *Phytophthora* sporangia)

(C) ECONOMIC BOTANY

Botanical name, Family, Distribution and uses of following

- i. Jowar
- ii. Gram
- iii. Pea
- iv. Mustard

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SYLLABUS FOR F.Y B.Sc.
BIOLOGY PRACTICAL - II (BOTANY)
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SEMESTER – I

(A) NURSERY MANAGEMENT

- i) Study of methods of propagation with the help of suitable materials – tubers, bulbs, rhizomes, corms, suckers and runners.
- ii) Propagation of horticultural plants by stem cuttings and air layering.
- iii) Propagation of horticultural plants by grafting and ‘T’ budding.
- iv) Visit to nursery and polyhouse/greenhouse.

(B) WEED MANAGEMENT

Observation of weeds with reference to Botanical Name, Family, Morphological peculiarities:

Native – *Cynadon* , *Cyprus*, *Amaranthus*, *Panicum*

Exotic/Invasive – *Alternanthera*, *Desmostachya*, *Euphorbia*, *Malachara*

(C) HIGHER CRYPTOGAMS

(1) Moss (*Funaria*):

To study the external features of *Funaria*.

(Permanent slides of *Funaria* antheridia W.M.; *Funaria* archegonia W.M.)

(2) *Riccia*

Preparation of slides from the fresh/ Preserve material of *Riccia* (T.S)

(Permanent slides of *Riccia* Thallus, *Riccia* antheridia v.s.; *Riccia* archegonia v.s.; *Riccia* sporophyte v.s.)

(3) *Nephrolepis* :

Preparation of slides from the fresh material of T.S of Stolon & T.S. of Rachis by the students.

(Permanent slides: T.S. of Stolon, T.S. of Rachis, T.S. of leaflet passing through sori, *Nephrolepis* prothallus, Fern sori W.M., prothallus with antheridia, prothallus with archegonia, prothallus with sporophyte.)

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BOTANY PAPER-203
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SEMESTER - II

BOT – 203 : Plant Physiology, Plant Ecology, Plant Anatomy And Medicinal Plants

UNIT – I: PLANT PHYSIOLOGY

- (1) Imbibition.
- (2) Plant movement:
- (3) Photosynthesis-Definition, pigments, Quantasome, C3 and C4 plants

UNIT: II - PLANT ECOLOGY

- (1) Ecological adaptations of Hydrophytes, Mesophytes and Xerophytes with appropriate examples.

UNIT: III - PLANT ANATOMY

- (1) Study of normal secondary growth in dicotyledone stem and root.
- (2) Stele: Definition and types
- (3) Vascular bundles : Definition and types
- (4) Ergastic matters : Starch grain, Aleurone grains, Raphides, Sphaerephides, Cystolith.

UNIT: IV- MEDICINAL PLANTS

Scientific name, family, part used and medicinal uses of the following:

1. *Abrus precatorious*
2. *Tinospora cordifolia*
3. *Adhatoda vasica*
4. *Ocimum sanctum*
5. *Asparagus recemosus*

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BOTANY PAPER-204
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SEMESTER - II

BOT -204: Diversity Of Phanerogames, Herbal Cosmetics, Human Affairs & Plant Diseases

UNIT: I- GYMNOSPERMS (*Cycas*)

General characters, classification, external morphology, internal structure
(*Cycas* leaflet and Rachis), reproduction and alternation of generation in *Cycas*.

UNIT: II- ANGIOSPERMS

Classification as per Bentham & Hooker's system of Classification, general characters, economic and medicinal importance, Botanical name of common important plants of the following families.

(1) Malvaceae (2) Cucurbitaceae (3) Apocynaceae (4) Convolvulaceae
(5) Nyctaginaceae (6) Amarillidaceae

UNIT: III - HERBAL COSMETICS:

(i) Types of herbal cosmetics w.r.t.: Botanical source, characteristics, plant's part used and uses of following:

A) Skin care: (i) Sandal wood (ii) Turmeric (iii) Cucumber

B) Hair care:(i) Heena (ii) Shikakai (iii) Amla

C) Dental care : i) Neem ii) Acacia iii) Pongamia

UNIT: IV - HUMAN AFFAIRS AND PLANT DISEASES

(1) Forests: Importance of forests and their conservation.

(2) Definition and importance of : Agriculture, Silviculture, Horticulture & Arboretum

(3)Plant Pathology

Causal organisms, symptoms and control measures of the following plant diseases.

(i) Citrus canker.

- (ii) Rust of Wheat. (Puccinia)
- (iii) Red rot of Sugarcane.
- (iv) Green ear of Bajara.

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(A) Plant physiology

(Experiment to be demonstrated)

- (i) Imbibition and Imbibition force
 - (a) Test tube experiment.
 - (b) Indicator experiment
- (ii) Plant movements
 - (a) Geotropism
 - (b) Phototropism
 - (c) Hydrotropism
- (iii) Photosynthesis
 - (a) Mohl's half leaf experiment
 - (b) Light is necessary for photosynthesis

(B) Plant ecology

- (i) Hydrophytes:
 - (a) Fresh specimens to be shown to the students:
Hydrilla, Vallisneria, Eichhornia, Pistia, Nymphaea, Marsilea.
- (ii) Mesophytes:
 - (a) Fresh specimens to be shown to the students:
Coriander, Trigonella, Garlic (Entire plants)
- (iii) Xerophytes:
 - (a) Fresh specimens to be shown to the students
Solanum xanthocarpum, Casuarina, Aloe vera, Opuntia, Euphorbia tiruculli

(C) Plant Anatomy

- (1) Study of normal secondary growth in Sunflower stem and root .
- (2) Stele: Study of stele from permanent slides:
 - (i) Actinostele.

- (ii) Plectostele.
- (iii) Amphiphloic siphonostele.
- (iv) Eustele.
- (v) Atactostele.

(3) Vascular Bundles:

Study of various types of Vascular bundles from Permanent slides.

- (i) Radial
- (ii) Amphicribal (Hadrocentric)
- (iii) Collateral and open
- (iv) Collateral and closed
- (v) Bicollateral

(4) Non living cell contents

Slides are to be prepared by the students from given materials.

- (i) Starch grains: Potato tuber, Wheat or Rice , Euphorbia tiruculli.
- (ii) Aleurone grains: Castor seed.
- (iii) Mineral Crystals:
 - (a) Raphides: Pothos, Colocasia petiole.
 - (b) Sphaeraphides: Opuntia, Nerium leaf.
 - (c) Cystolith: Ficus (Banyan) leaf.

(D) Medicinal Plants

- (i) *Abrus precatorius*
- (ii) *Tinospora cordifolia*
- (iii) *Adhatoda vasica*
- (iv) *Ocimum sanctum*
- (v) *Asparagus recemosus*

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SEMESTER – II

(A) Gymnosperms (Cycas)

Preparation of slides from the fresh material of T.S. of Rachis & T.S. of Leaflet by the students.

Permanent Slides: T.S. of Leaflet, T.S. of Rachis, T.S. of Coralloid root, T.S. of Microsporophyll, T.S. of Megasporophyll, L.S. of Ovule.

Preserve Specimen: Coralloid root, Microsporophyll and Megasporophyll.

(B) Angiosperm: (Families)

Study of Morphological characters, Floral dissection, T.S of Ovary and floral formulae of following families.

- (i) Malvaceae : *Hibiscus rosasinensis, Thespesia, Gossypium.*
- (ii) Cucurbitaceae : *Coccinia indica*
- (iii) Convolvulaceae: *Ipomea palmata*
- (iv) Apocynaceae : *Nerium, Allamanda, Catharanthus roseus.*
- (v) Nyctaginaceae : *Bougainvillia, Mirabilis.*
- (vi) Amaryllidaceae : *Crinum, Polianthes.*

(C) Herbal Cosmetics

Observation of following herbal plants with reference to Botanical Name, Family, Morphological peculiarities and their herbal uses.

A) Skin care: (i) Sandal wood (ii) Turmeric (iii) Cucumber

B) Hair care:(i) Heena (ii) Shikakai (iii) Amla

C) Dental care : i) Neem ii) Acacia iii) Pongamia

(D) Plant Pathology

Causal organisms, symptoms and control measures of the following plant diseases.

- (i) Citrus canker.
- (ii) Rust of Wheat. (*Puccinia*)
- (iii) Red rot of Sugarcane.
- (iv) Green ear of Bajara.

Reference Book

Sr. No.	Name of the Book	Author/s	Edition	Publisher
1	College Botany Vol. I - III	Gangulee, etal.	5 th Edi. 1990	New central book agency Calcute
2	College Botany	A. C. Datta	3 rd Edi. 1989	Oxford Bombay
3	Taxonomy of Angiosperms	V. Singh	1 st Edi. 1981	Rastogi pub.
4	Cryptogamic Botany Vol. I - II	G.M.Smith	2 nd Edi. 1955	Tata MCGrow Hill Bombay
5	Vansptishaastra paper 1 (Semester I)	Dr. T.G.Gohil and Dr. Alpesh B. Thakor	1 st Edi. 2011	Popular prakashan, Surat
6	Vansptishaastra	J.V.Joshi & H.K.Patel	4 th edi. 2002	Popular prakashan, Surat
7	A text book of Botany vol. I (Algae, Fungi, Bacteria, Viruses, Lichen & Plant pathology)	Pandey etal.	-	Vikash publishing House Pvt. Ltd., New Delhi
8	A text book of Botany vol. II (Bryophyta, Pteridophyta, Gymnosperms & Paleo Botany)	Pandey etal.	-	Vikash publishing House Pvt. Ltd., New Delhi
9	A text Book of Botany paper III	Dr. T.G.Gohil and Dr. Alpesh B. Thakor	1 st Edi. 2007 - 2008	Popular prakashan, Surat
10	A Brief Course in Algae	K.P.Saxena	1965	Prakashan Kendra, Lucknow.
11	Introduction to Fungi	S.Sundara Rajan	1 st Edi. 2001	Anmol Publication, New Delhi
12	Botany for Degree Student-	P.C. Vashishta	1 st Edi. 1971	S. Chand &

	Bryophyta & Pteridophyta			Company, New delhi.
13	Modern Practical Botany Vol. II	B.P. Pandey	1995	S. Chand & Company, New delhi.
14	Plant Anatomy	B.P. Pandey	1 st Edi 1978	S. Chand & Company, New delhi.
15	Taxonomy of Angiosperms	V. Singh	1 st Edi. 1981	Rastogi pub.
16	Modern Practical Botany Vol. II	B.P. Pandey	1995	S. Chand & Company, New delhi.
17	Vansptishaastra paper 1 (Semester II)	Dr. T.G.Gohil and Dr. Alpesh B. Thakor	1 st Edi. 2011	Popular prakashan, Surat
18	Economic Botany	Albert F. Hill	2 nd Edi. 1976	Tata McGRAW Hill, New Delhi
19	Plant Physiology	Susbeela M. Das	1 st Edi. 2003	Dominant publisher, New Delhi
20	A text book of Plant Ecology	R.S. Ambasht	1st Edi. 1969	Students friends & co., Varanasi
21	Plant pathology	R.S. Mehrotra	4th Edi. 1987	Tata McGRAW Hill, New Delhi
22	Beauty Through Herbs, Institute of Herbal Science	Jain Urjita	1997	A-10 Raj Industrial Complex, Andheri , Mumbai.
23	Foods, Drugs And Cosmetics: A Consumer Guide. The Mac millan Company Of India Ltd.	Jacob Thankamma	1975	Delhi, Bombay