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
Effective from July – 2011
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
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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 CRYPTOGRAMS

(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
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) Hetrophyllly

(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) Quinuncial: 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) Capitate: 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 Zygospore.

(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
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 – Cynodon, 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.)
UNIT – I: PLANT PHYSIOLOGY

(1) Imbibition.
(2) Plant movement:
(3) Photosynthesis-Definition, pigments, Quantaosome, 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. *Abras precatorious*
2. *Tinospora cordifolia*
3. *Adhatoda vasica*
4. *Ocimum sanctum*
5. *Asparagus recemosus*
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.
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) 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:

\textit{Hydrilla, Vallisneria, Eichhornia, Pistia, Nymphaea, Marsilea.}

(ii) Mesophytes:
(a) Fresh specimens to be shown to the students:

\textit{Coriander, Trigonella, Garlic (Entire plants)}

(iii) Xerophytes:
(a) Fresh specimens to be shown to the students

\textit{Solanum xanthocarpum, Casuarina, Aloe vera, Opuntia, Euphorbia tiruculli}

(C) Plant Anatomy


(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) Amphicribral (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: Pothis, 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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SYLLABUS FOR F.Y B.Sc.
BILOGY PRACTICAL - II (BOTANY)
BOT : 204 Practical based on BOT : 204 (Theory)
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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.


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 palmeta
(iv) Apocynaceae: Nerium, Allamanda, Catharanthus roseus.
(v) Nyctaginaceae: Bougainvallia, Mirabilis.
(vi) Amaryllidaceae: Crinum, Polianthes.

(C) Herbal Cosmatics

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

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<th>Author/s</th>
<th>Edition</th>
<th>Publisher</th>
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<tr>
<td>2</td>
<td>College Botany</td>
<td>A. C. Datta</td>
<td>3rd Edi. 1989</td>
<td>Oxford Bombay</td>
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<td>4</td>
<td>Cryptogamic Botany Vol. I - II</td>
<td>G.M.Smith</td>
<td>2nd Edi. 1955</td>
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<td>5</td>
<td>Vansptishastra paper I (Semester I)</td>
<td>Dr. T.G.Gohil and Dr. Alpesh B. Thakor</td>
<td>1st Edi. 2011</td>
<td>Popular prakashan, Surat</td>
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<td>A text Book of Botany paper III</td>
<td>Dr. T.G.Gohil and Dr. Alpesh B. Thakor</td>
<td>1st Edi. 2007 - 2008</td>
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<td>10</td>
<td>A Brief Course in Algae</td>
<td>K.P.Saxena</td>
<td>1965</td>
<td>Prakashan Kendra, Lucknow.</td>
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<td>Introduction to Fungi</td>
<td>S.Sundara Rajan</td>
<td>1st Edi. 2001</td>
<td>Anmol Publication, New Delhi</td>
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<td>Botany for Degree Student-</td>
<td>P.C. Vashishta</td>
<td>1st Edi. 1971</td>
<td>S. Chand &amp;</td>
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<td>Albert F. Hill</td>
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<td>Susbeela M. Das</td>
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