GUJARAT UNIVERSITY

BOTANY

Choice Based Credit System (CBCS) Theory Syllabus

Effective from June-2012

SEMESTER-III

Course BOT-201

Detailed Curriculum has been designed as per semester system. There shall be three theory paper having four units.

Contact Hours per week: 4 Duration: 3 hours

Unit-1 Study of lower plants

Objective: To acquaint students with lower plants.

UNIT I: ALGAE

1. Habit and habitat of algae.
2. Life history of following genera including morphology and excluding development:
    a. ***Oedogonium***
    b. ***Ectocarpus***
    c. ***Batrachospermum***

Suggested Readings

1. Pandey, S. N., Trivedi, P. S. and Misra S. P. 2005. *A Textbook of Botany Vol. I and II*, Vikas Publishing House Pvt. Ltd.
2. Das, Dutta, Gangulle and Kar., 1959. *College Botany Vol. I and II*, New Central book Agency.
3. Vashishta, D.R. 2005. Algae, S. Chand Publications, New Delhi.
4. Smith, G.M. 1972. *Cryptogamic Botany Vol. I*, Tata McGraw Hill Publishing Co. Ltd. New Delhi.
5. Morris, I. 1986. An Introduction to the Algae. Cambridge University press, U.K.
6. Round, F.E. 1986. *The biology of Algae*, Cambridge University Press, U.K.
7. Kumar, H.D. 1988. *Introductory Phycology*. Affiliated East-West Press Ltd., New Delhi

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SEMESTER-III

Course BOT-201

Detailed Curriculum has been designed as per semester system. There shall be one theory paper having four units.

Contact Hours per week: 4 Duration: 3 hours

UNIT II: **FUNGI**

1. Ultra structure of fungal cell

2. Life histories of following genera including morphology excluding development (classification according to Ainsworth):-

- **a.** ***Claviceps***
- **b.** ***Puccinia***

3. Types of **Lichens**

Suggested Readings:

1. Webster, J. 1985. *Introduction to Fungi*. Cambridge University Press, U.K.
2. Pandey, S. N. , Trivedi, P.S. and Misra S.P. 2005. *A Textbook of Botany Vol. I and II*, Vikas Publishing House Pvt. Ltd.
3. Das, Dutta, Gangulle and Kar., 1959. *College Botany Vol. I and II*, New Central book Agency.
4. Vashishta, B.R. 1969. *Botany for degree student Part II. Fungi*. S. Chand Publications, New Delhi.
5. Smith, G.M. 1972. *Cryptogamic Botany Vol. I*, Tata McGraw hill Publishing Co. Ltd. New Delhi.
6. Mehrotra, R.S. and Aneja, R.S. 1988. *An Introduction to Mycology*, New Age Intermediate Press.
7. Alexopoulus, C.J. 1962. Introductory Mycology. John Wiley and Sons Inc.

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Detailed Curriculum has been designed as per semester system. There shall be one theory paper having four units.

Contact Hours per week: 4 Duration: 3 hours

UNIT III: BRYOPHYTA

1. Life histories of the following with external and internal structure excluding development.
   - **a. Hepaticopsida : *Plagiochasma***
   - **b. Bryopsida : *Funaria.***
2. Economic importance of Byryophyta**.**

Suggested Readings:

1. Pandey, S. N. , Trivedi, P. S. and Misra S.P. 2005. *A Textbook of Botany Vol. I and II*, Vikas Publishing House Pvt. Ltd.
2. Das, Dutta, Gangulle and Kar., 1959. *College Botany Vol. I and II*, New Central book Agency.
3. Vashishta, B.R. 1983. *Botany for degree student- Bryophytes,* S. Chand Publications, New Delhi.
4. Parihar, N.S. 1991. *Bryophyata*. Central Book Depot, Allahabad, India.
5. Puri, P. 1980. *Bryophytes.* Atmaram and Sons., Delhi, India.
6. Smith, G.M. 1972. *Cryptogamic Botany Vol. I*, Tata McGraw Hill Publishing Co. Ltd. New Delhi, India.

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SEMESTER-III

Course BOT-201

Detailed Curriculum has been designed as per semester system. There shall be one theory paper having four units.

Contact Hours per week: 4 Duration: 3 hours

UNIT IV: ECONOMIC BOTANY

1. Plant fibers: Cotton, Jute and Coir.
2. Habit, Habitat, Family, Botanical name, Useful parts and uses of the following Timber species:
   i. *Tectona grandis*
   ii. *Dalbergia sissoo*
   iii. *Gmelina arborea*
   iv. *Madhuca indica*
   v. *Azadirachta indica*.
3. Habit, Habitat, Family, Botanical name, Useful parts and uses of the following Essential oils – Sandalwood, Eucalyptus, Jasmine, Kewra.
4. A general account of organic manure.

Suggested Readings:

1. Sen, S. 1992. *Economic Bota*ny, New Central Book Agency, Culcutta.
2. Verma, V. 1974. *A Textbook of Economic Botany*, Emcay Publication, New Delhi.
3. Kochar, S.L. 2011. *Economic Botany in the Tropics*, 4th edition, Mc Millan Publications, New Delhi.
4. Hiil, A. 1976. *Economic Botan*y, Tata McGraw Hill Publishing Co., Ltd., New Delhi.
5. Bendre, A., Kumar, A. *Economic Botany*, Rastogi Publication, New Delhi. India.

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SEMESTER-III (Practical)

Course BOT-203

1. Study of Algae-

(i) ***Oedogonoium*:** Mounting of Vegetative thallus and Macrandrous and Nanedrous species.

Permanent slides of sexual reproduction, cap cell.

(ii) ***Ectocarpus*:** Mounting of vegetative thallus, Unilocular and Plurilocular sporangium.

Permanent slides of Unilocular and Plurilocular sporangium.

(iii) ***Batrachospermum:*** Mounting of vegetative thallus, Cystocarp.

Permanent slides of antheridia, archegonia and cystocarp.

2. Study of Fungi-

(i) ***Claviceps*:** Mounting of conidia

Permanent slides of Claviceps stroma.

(ii) ***Puccinia*:** Mounting of Uredospore and Telutospore.

Permanent slides of Uredospore, Telutospore, Pycneospore and aciospore.

3. Study of Bryophytes-

(i) ***Plagiochasma:*** Specimen of Thallus, Reproductive organs**.**

Permanent slides or charts of V.S. of thallus, Reproductive organs.

(ii) ***Funaria*:** Mounting of Antheridia, Archegonia, Peristomial teeth.

Specimen Funaria gametophyte with sporophte

Permanent slides of Antheridia, Archegonia, Sporophyte

4 Study of Economic Botany as per theory syllabus.

Suggested Readings:

(i) Practical Botany Vol. I by Bendre & Kumar, Rastogi Publication.

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SEMESTER-III (Practical)

Course BOT-203

Session-I

Date:_____ Total Marks: 35

Time: 3 Hours

Q.1 Identify and classify with reasons Specimen A and B.	10
Q.2 Identify and describe peculiarities of given specimen C and D.	10
Q.3 Viva voce	15

Session-II

Date:_____ Total Marks: 35

Time: 3 Hours

Q.1	Expose the reproductive organ from given specimen E. Prepare the temporary slide and show it to the examiner.	06
Q.2	Identify and describe the specimens F, G, H with its family, Botanical name, Chemical constituents and economic importance.	12
Q.3	Project or Submission (as per Semester-III topics)	12
Q.4	Journal	05

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Effective from June-2012

SEMESTER-III

Course BOT-202

Detailed Curriculum has been designed as per semester system. There shall be one theory paper having four units.

Contact Hours per week: 4 Duration: 3 hours

UNIT I: ANATOMY

1. Meristems: characteristics, classification and theories of root and shoot apex.
2. The cambium: Types and functions.
3. Simple tissues
4. Secondary growth in Sunflower stem and root.
5. Anomalous Secondary growth in Salvadora stem

Suggested Readings:

1. Roy, Piyush. *Plant Anatomy*, New Central Book Agency, Calcutta
2. Das, Dutta, Gangulle and Kar., 1959. *College Botany Vol. I and II*, New Central Book Agency.
3. Esau, K. 2006. *Plant Anatomy*. Pub John Willey & Sons Inc.
4. Fahn, A. 1990. *Plant Anatomy*. Pergamon Press, University of Michigan
5. Mc Daniels, Eanes. *Plant Anatomy*. Pub John Willey & Sons Inc.

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Choice Based Credit System (CBCS) Theory syllabus

Effective from June-2012

SEMESTER-III

Course BOT-203

Detailed Curriculum has been designed as per semester system. There shall be one theory paper having four units.

Contact Hours per week: 4 Duration: 3 hours

UNIT II: ECOLOGY

1. Edaphic factors:

   Composition of soil, origin and development of soil, soil moisture, soil profile, soil erosion and soil conservation.
2. Biological clock
3. Remote sensing
4. Heterotrophic nutrition in plants.
5. Ecological adaptation in Hydrophytes and Xerophytes.

Suggested Readings:

1. Sharma, P.D. 2001. *Ecology and Environment*. Rastogi Publication, Meerut.
2. Odum, E.P. 1983. *Basic Ecology*. Saunders, Philadelphia.
3. Odum, E.P. 1971. *Fundamentals of Ecology*. W.B. Saunders, Philadelphia.
4. Misra, R.& Puri, G.S. 1968. *Indian Manual of Plant Ecology*. Oxford & IBH, New Delhi.
5. Stiling, P. *Ecology: Theories and application*. Harper Collins New York.

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Choice Based Credit System (CBCS) Theory syllabus

Effective from June-2012

SEMESTER-III

Course BOT-203

Detailed Curriculum has been designed as per semester system. There shall be one theory paper having four units.

Contact Hours per week: 4 Duration: 3 hours

UNIT III: EMBRYOLOGY

1. Structure of microsporangium and male gametophyte.
2. Structure of ovule and its types.
3. Structure of megasporangium and female gametophyte.

   Monosporic, Bisporic, Tetrasporic (Fritillaria type).
4. Pollination in Salvia and Calotropis.
5. Fertilization.

Suggested Readings:

1. Bhojwani, S.S. and Bhatnagar, S.P. 2000. *The Embryology of angiosperms*. Vikas Publishing House, New Delhi.
2. Bhojwani, S.S. and Bhatnagar, S.P. *The Embryology*. Rastogi Publication, Meerut.
3. Das, Dutta, Gangulle and Kar., 1959. *College Botany Vol. I and II*, New Central book Agency.
4. Johri, B. M. 1984. *Embryology of angiosperms*, Nordic Journal of Botany.
5. Johri, B. M. Shivanna 1984. *The Angiosperms pollen*. Nordic Journal of Botany.

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SEMESTER-III

Course BOT-203

Detailed Curriculum has been designed as per semester system. There shall be one theory paper having four units.

Contact Hours per week: 4 Duration: 3 hours

UNIT IV: Cytology

- Plant cell: Ultra structure.
- Structure and Function of:

a. Cell wall

b. Endoplasmic reticulum

c. Ribosome

d. Nucleus

e. Lysosome

f. Dictyosome

Suggested Readings:

1. Verma, P. Agarwal S. *Cytology*. S. Chand and Co.
2. Gunnings, B.E.S. and Steer, M.W. 1996. *Plant cell Biology structure & function.* Jones Barlett Publishers, Boston, Massachusetts.
3. Smith, B. Hardin, P. *The world of the cell*
4. Paul, A. *Cell and Molecular Biology*. Allied Pvt.
5. Lyndon, R.F. 1990. *Plant development. The Cellular Basis*. Unnin Hyman, London.
6. Roberties, D. *Cell biology*

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BOTANY

Choice Based Credit System (CBCS) Theory syllabus

Effective from June-2012

SEMESTER-III (Practical)

Course BOT-204

Session-I

SEMESTER-III:

Unit-I Anatomy

(i) Permanent slides of shoot apex (Dictyota and chara) and root apex.

(ii) Permanent slides of cambium and cork cambium

(iii) Permanent slides of Parenchyma, Collenchyma, Sclerenchyma and Chlorenchyma

(iv) Mounting of shoot apex from hydrilla shoot.

(v) Permanent slides of Sunflower stem, root and Salvadora stem secondary growth.

(vi) Double stain temporary preparation of Sunflower stem, root and Salvadora stem secondary growth.

Unit-II Ecology

(i) Water holding capacity of soil.

(ii) Heterotrophic nutrition in plant specimens

(iii) Hydrophytes- Hydrilla, Nymphea, Eichornea, Trapa.

(iv) Xerophytes- Nerium, Agave, Opuntia, Euphorbia

Unit-III Embryology

(i) Pollen germination

(ii) Permanent slide of T.S. of Anther, Pollen grain on stigma

(iii) Permanent slide or charts of Ovules.

(iv) Permanent slide of female gametophyte.

UNIT IV: Cytology

(i) Plant cell: Ultra structure model or chart

(ii) Cell wall chart

(iii) Micrograph or chart of Endoplasmic reticulum, Ribosome, Nucleus, Lysosome, Dictyosome

Suggested Readings:

(i) Practical Botany vol. I & II By Bendre and Kumar, Rastogi Publication

(ii) Practical Botany by S. C. Santra, Chettarjee and Das, New Central Book Agency.

(iii) Experimental Plant Ecology by Pratima Kapur and Sudha Rani, CBS Publication

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SEMESTER-III (Practical)

Course BOT-204

Session-I

Date: _____ Total Marks: 35

Time: 3 Hours

Q.1 Take T. S. and prepare a double stained slide of given specimen A. 10

Q.2 Identify and describe external and internal ecological adaptation of given specimen B. 06

Q.3 Identify and describe mode of nutrition in given specimen C& D

E Ecology 09

Q.4 Viva voce 10

Session-II

Date: _____ Total Marks: 35

Time: 3 Hours

Q.1 Expose pollen grain and germinate in proper media from specimen A. 06

Q.2 Identify and describe specimen B & C with cytological view. . 08

Q.3 Identify and describe permanent slides of E & F (Embryology) 06

Q.4 Project (Ecology or Cytology) 10

Q.5 Journal 05

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SEMESTER-IV

Course BOT-205

Detailed Curriculum has been designed as per semester system. There shall be one theory paper having four units.

Contact Hours per week: 4 Exam Duration: 3hours

UNIT I: PTERIDOPHYTA

1. Life histories of the following with morphology and anatomy excluding development.
    a. **Lycopsida : *Selaginella***
    b. **Pteropsida : *Adiantum***
2. Heterospory and seed habitat.
3. Condition and formation of fossils.

Suggested Readings:

1. Pandey, S.N. , Trivedi, P.S. and Misra S.P. 2005. *A Textbook of Botany Vol. I and II*, Vikas Publishing House Pvt. Ltd.
2. Das, Dutta, Gangulle and Kar., 1959. *College Botany Vol. I and II*, New Central book Agency.
3. Vashishta, B.R. 1983. *Botany for degree student- Pteridophyta*, S. Chand pub, New Delhi.
4. Parihar, N.S. 1991. *Pteridophyta*. Central Book Depot, Allahabad.
5. Sporne, K.K. 1991. *The Morphology of Pteridophytes*. B.I. Publishing Pvt. Ltd. Bombay.

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Choice Based Credit System (CBCS) Theory syllabus

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SEMESTER-IV

Course BOT-205

UNIT II: **GYMNOSPERMS**.

1. General characters.
2. Classification of Gymnosperms by Chamberlain (1934).
3. Life history of *Pinus* including Morphology, Anatomy (Secondary structure of stem, R.L. S., T.L.S.), Reproduction, Embryogeny.

Suggested Readings:

1. Bhatnagar, S.P. and Moitra, A. 1996. *Gymnosperms*. New Age International Pvt. Ltd., New Delhi.
2. Vashishta, P.C. 1983. *Botany for degree student- Gymnosperms*, S. Chand Publications, New Delhi.
3. Chopra, G.L. *Gymnosperms*. S. Nagin & Co., Jullundhar.
4. Vashishta, P.C. 1983. *Gymnosperms*, S. Chand Publications, New Delhi.
5. Coulter, J.M. & Chamberlain, C.J. 1978. *Morphology of Gymnosperms*. Central Book Depot, Allahabad.
6. Foster, A.S. and Gifford, F.M. 1967. *Comparative Morphology of Vascular plants*. Freeman Publishers, Sanfransisco.
7. Bierhost, D.W. 1971. *Morphology of vascular plants*. Mc Millan, New York.

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Effective from June-2012

SEMESTER-IV

Course BOT-205

Detailed Curriculum has been designed as per semester system. There shall be one theory paper having four units.

Contact Hours per week: 4 Duration: 3 hours

UNIT III: MORPHOLOGY AND TAXONOMY

Angiosperms: Morphology:

1. Types of Leaf and phyllotaxy.
2. Classification of the following families as per Bentham and Hooker's system of classification including examples of economic importance.
    a. Dicotyledons:
        i. Polypetalae : *Cruciferae, Cesalpinaceae,*
        ii. Gamopetalae : *Rubiaceae, Apocynaceae*
        iii. Apetlae: *Euphorbiaceae,*
    b. Monocotyledons:

        Palmae and *Gramineae.*

Suggested Readings:

1. Raghavan, V. 1999. *Developmental Biology of flowering plant*. Springer- Verlag, New York.
2. Singh, G. 1999. *Plant Systematics- Theory nad Practice*. Oxford and IBH Publishing Co. Pvt. Ltd, New Delhi.
3. Naik, V.N. 1984. *Taxonomy of angiosperms*. Tata McGraw- Hill Publishing Co. Ltd. New Delhi.
4. Verma B.K. 2011. *Introduction to Taxonomy of angiosperms*. PHI Learning Pvt. Ltd. New Delhi.
5. Takhtajan 1997, *Diversity and Classifaication of Flowering Plants*. Columbia University Press, New York.

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SEMESTER-IV

Course BOT-205

Detailed Curriculum has been designed as per semester system. There shall be one theory paper having four units.

Contact Hours per week: 4 Duration: 3 hours

UNIT IV: PLANT PHYSIOLOGY

1. Absorption of water
   a. Properties of water.
   b. Mechanism of water absorption.
   c. Transportation of water: Dixon's theory of cohesion force.
2. Growth and development
   Definition, Phases of Growth
3. Mineral nutrition in plants
   Macro and Micronutrients-C, H, O, N, S, P, K, Ca, Fe, Mg, Mn, Zn, B, Cu, Mo
   Source, Functions and Deficiency symptoms.

Suggested Readings:

1. Verma, S.K. *Plant Physiology*. S. Chand & Co.
2. Verma, S.K. *Plant Physiology*. Emkay Publication.
3. Sundararjan, S. *College Botany Vol. I to IV*. Himalaya Publishing House.
4. Witham, F.H., Delvin , R.M. 1983. *Plant Physiology*. Willard Grant. Boston, MA.
5. Salisbury, F.B. & Ross, C.W. 1992. *Plant Physiology*. Wadsworth Publishing Co. California, USA.
6. Kumar, A. & Purohit, S.S.2001. *Fundamentals & Application* 2nd edition. Agrobios.

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SEMESTER-IV (Practical)

Course BOT-207

SEMESTER 4:

Unit-I Pteridophytes:

(i) ***Selaginella:*** Specimen

Selaginella cone L.S. & T.S. Permanent slides.

Mounting of *Selaginella* spores from cone.

(ii) ***Adiantum*****:** Specimen

Permanent slide of T.S. Passing through sori of *Adiantum* leaflet.

Mounting of sporangia of *Adiantum*

Unit-II Gymnosperm

(i) Pinus

Mounting of Pollengrain

T.S. of Pinus needle.

Specimens: Male cone, Female cone, Needle

Permanent slides: Ovule, Needle, male cone L.S.

Unit-III Morphology and Taxonomy

(i) Morphology specimens as per theory syllabus.

(ii) Study of Families as per theory syllabus.

Unit-IV Plant Physiology

(i) Demonstration practical Conduction of water through xylem.

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SEMESTER-IV (Practical)

Course BOT-207

Session-I

Date:_____ Total Marks: 35

Time: 3 Hours

Q.1 Identify and classify giving reasons of given Specimen A. 05

Q.2 Identify and classify giving general characters of the given family from specimen B & C. 14

Q.3 Identify and describe specimen D & E (Pteridophyte, Gymnosperm and Physiology) 06

Q.3 Viva voce 10

Session-II

Date: _____ Total Marks: 35

Time: 3 Hours

Q.1	Expose reproductive structure from specimen F.	08
Q.2	Identify and describe Morphology of specimen G, H & I	12
Q.3	Herbarium	10
Q.4	Journal	05

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Effective from June-2012

SEMESTER-IV

Course BOT-206

Detailed Curriculum has been designed as per semester system. There shall be one theory paper having four units.

Contact Hours per week: 4 Exam Duration: 3hours

UNIT I: ANATOMY

1. Complex tissue (Xylem and Phloem).
2. Epidermal tissue system including Periderm and Lenticels.
3. Anamalous primary structures in ***Nyctanthes*** **stem**.
4. Anamalous Secondary growth in ***Bignonia*** **stem**.
5. Anamalous Secondary growth in ***Ficus*** **aerial root**.

Suggested Readings:

1. Roy, Piyush. *Plant Anatomy*, New Central Book Agency, Calcutta
2. Das, Dutta, Gangulle and Kar., 1959. *College Botany Vol. I and II*, New Central Book Agency.
3. Esau, K. 2006. *Plant Anatomy*. Pub John Willey & Sons Inc.
4. Fahn, A. 1990. *Plant Anatomy*. Pergamon Press, University of Michigan
5. Mcdaniels, Eanes. *Plant Anatomy*. Publications, John Willey & Sons Inc.

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Choice Based Credit System (CBCS) Theory syllabus

Effective from June-2012

SEMESTER-IV

Course BOT-206

Detailed Curriculum has been designed as per semester system. There shall be one theory paper having four units.

Contact Hours per week: 4 Duration: 3hours

UNIT II Economic Botany

A brief introduction of medicinal plants and their chief constituents:

Turmeric, *Ephedra, Adhatoda,Terminalia chebula, Tinospora, Isaphgul.*

Firewood species:

a. *Prosopis* spp.
b. *Holoptelia integrifolia*
c. *Zizyphus jujuba*
d. *Acacia nilotica.*
e. *Salvadora persica.*

A concise account of Tobacco

Suggested Readings:

1. Sen, S. 1992. *Economic Botany*, New Central Book Agency, Calcutta.
2. Verma, V. 1974. *A Textbook of Economic Botany*, Emcay Publication, New Delhi.
3. Kochar, S.L. 2011. *Economic Botany in the Tropics*, 4th edition, Mcmillan Pub, New Delhi.
4. Hiil, A. 1976. *Economic Botany*, Tata Mc Graw Hill Publishing Co., Ltd., New Delhi.
5. Bendre, A., Kumar, A. *Economic Botany*, Rastogi Publication, New Delhi.

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SEMESTER-IV

Course BOT-206

Detailed Curriculum has been designed as per semester system. There shall be one theory paper having four units.

Contact Hours per week: 4 Exam Duration: 3hours

UNIT III: GENETICS

1. Mendelian genetics (Monohybrid, Dihybrid ratio).
2. Gene interactions (Complementary and Supplementary genes).
3. Cytoplasmic inheritance : (Mirabilis, male sterility in maize)
4. Sex determination in plants.

Suggested Readings:

1. Powar. *Genetics* Vol. I & II
2. Strickberger, M.W. 2008. *Genetics*. PHI Learning Pvt. Ltd. New Delhi.
3. Arumugon, N. *Cell Biology, Genetics, Evolution.* Saras Publication, Kanyakumari.
4. Stent, G.S. 1971. *Molecular Genetics*. W.H. Freeman. San Francisco.
5. Russel, P.J. 1992. *Genetics*. Harper Collins College.

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Effective from June-2012

SEMESTER-IV

Course BOT-206

Detailed Curriculum has been designed as per semester system. There shall be one theory paper having four units.

Contact Hours per week: 4 Exam Duration: 3 hours

UNIT IV: BIOCHEMISTRY

1. pH and Buffer.
2. Protoplasm as a colloidal system.
3. Classification & types Carbohydrates and Lipids.
4. Enzymes:
    a. Definition
    b. Nomenclature and classification of enzymes
    c. Chemical nature of enzymes
    d. Properties of enzymes
    e. Mechanism of enzyme action
    f. Factors affecting enzyme activity

Suggested Readings:

1. Verma, S.K. *Plant Physiology*. S. Chand & Co.
2. Verma, S.K. *Plant Physiology*. Emkay Publication.
3. Sundararjan, S. *College Botany vol. I to IV*. Himalaya Publishing House.
4. Witham, F.H., Delvin , R.M. 1983. *Plant Physiology*. Willard Grant. Boston, MA.
5. Salisbury, F.B. & Ross, C.W. 1992. *Plant Physiology*. Wadsworth Publishing Co. California, USA.
6. Kumar, A. & Purohit, S.S.2001. *Fundamentals & Application 2nd edition*. Agrobios.

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SEMESTER-IV (Practical)

Course BOT-208

Unit-I Anatomy

(i) Permanent slides of Xylem and Phloem

(ii) Epidermal tissue system (a) Types of hairs and glands,
(b) Types of stomata, (c) Types of Epidermis (Unisereate and Multisereate) (d) Periderm and Lenticell

(iii) Make a temporary double stained preparation of *Nyctanthus* stem, *Bignonia* stem and *Ficus* aerial root.

Unit-II Economic Botany

As per the theory syllabus.

Unit-III Genetics

Genetics problems (as per appendix)

Unit-IV Biochemistry

(i) Determination of pH of Four various solutions.

(ii) Agar-agar (Sol & Gel)

(iii) Histochemical test of Carbohydrate (starch, glucose and Lignin) & Lipid.

(iv) Enzyme activity- amylase and Catalase

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SEMESTER-IV (Practical)

Course BOT-208

Session-I

Date:_____ Total Marks: 35

Time: 3 Hours

Q.1 Take T. S. and prepare a double stained slide of given specimen A. 10

Q.2 Identify and describe the specimens F, G, H with its family, Botanical name, it's Chemical constituents and economic importance. 15

Q.3 Viva voce 10

Session-II

Date: _____ Total Marks: 35

Time: 3 Hours

Q.1 Perform the Histochemical test of given specimen A 05

Q.2 Perform the enzyme activity amylase or Catalase. 05

Q.3 Determine pH value of given solution with the help of universal indicator and show your results to examiner. 05

Q.4 Solve the genetic problem 05

Q.5 Project (Genetics, Economic Botany or Biochemistry) 10

Q.6 Journal 05