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

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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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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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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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Choice Based Credit System (CBCS) Theory syllabus

Effective from June-2012

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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Choice Based Credit System (CBCS) Theory syllabus

Effective from June-2012

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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Choice Based Credit System (CBCS) Theory syllabus

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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

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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 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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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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Effective from June-2012

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