

“ Education for Knowledge, Science and Culture.”

– Shikshanmaharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha's

VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)



**Syllabus
for
Bachelor of Science**

B.Sc. Part - I BOTANY

(Semester-I & II)

Under Choice Based Credit System

CBCS Syllabus to be implemented from 2021 – 2022

(Subject to modifications in the future)

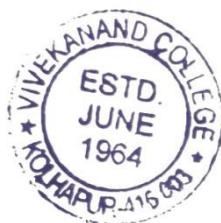


CHOICE BASED CREDIT SYSTEM

B.Sc. I (Sem. – I and II) Botany

Course Structure

Paper No.	Course Code	Title of Paper	No. of Credits
Semester I			
I	DSC -1007A	Biodiversity in Cryptogams and Gymnosperms	04
Semester II			
II	DSC-1007B	Plant Ecology and Angiosperm Taxonomy	04



CHOICE BASED CREDIT SYSTEM

B.Sc. - I: Botany

Paper - I "Biodiversity in Cryptogams and Gymnosperms"

(DSC – 1007 A)

Section I: Biodiversity in Microbes, Algae and fungi

Course Outcomes: On completion of the course, students will be able to:

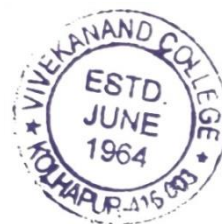
CO1: Understand identify and classify bacteria, fungal, algal and lichen live and preserved specimen.

CO 2: Understand classification of fungal, algal and lichen.

CO 3: Identify diatoms.

CO4: Identify VAM fungi.

Paper I	DSC 1007 A :“Biodiversity in Cryptogams and Gymnosperms” Section : I (DSC 1007A1): Biodiversity in Microbes, Algae and fungi	No. of Hours per Unit / Credit
Unit : I.	Microbes: : 1a: Virus: Discovery, General Characters, DNA virus (T Phage) and RNA virus (TMV),Economic importance. 1b. Bacteria- Discovery, General Characters, Cell structure, Types, Mode of reproduction - Binary fission, Budding, Conjugation, Transformation & Transduction , Economic importance.	07 hrs
Unit . II.	Algae and Fungi: 2a. Algae: General Characters, Classification (As per G. M. Smith) up to class with characters and suitable example, economic importance. A. Morphology and Life Cycle (Excluding developmental stages) of 1.Cyanophyceae- <i>Nostoc</i> 2.Chlorophyceae- <i>Spirogyra</i> B. 1. Diatoms 2.Algal biofertilizers and its importance 2b. Fungi: General Characters, Classification (As per Ainsworth) up to class. Morphology and Life Cycle (Excluding developmental stages) of a. Zygomycotina- <i>Mucor</i> b. Ascomycotina – <i>Penicillium</i> c. VAM fungi & its importance 2c. Lichen: Definition, structure of thallus, types, reproduction & economic importance.	23hrs (11 hrs.) (12 hrs.)



Total hours: 30

CHOICE BASED CREDIT SYSTEM

References:

- 1) Algae - H. D. Kumar and H. N. Singh (1991)
- 2) Algae - O. P. Sharma (1986)
- 3) Algae - B. P. Pandey (1994)
- 4) A Hand book of Lichens - D. D. Awasthi (2000)
- 5) An Introduction to Fungi - H. C. Dube (1990)
- 6) An Introduction to Fungi.-- H. C. Dube, 1990. Vikas Publishing House Pvt. Ltd., Delhi.
- 7) Introductory Phycology. H. D. Kumar, 1988, Affiliated East-West Press Ltd., New York.
- 8) Morphology of Plants and Fungi -- H.C. Blod, Aloxopoulos, G. J. and Delevoryas, T. 1980.(4th Edition) Harper and Foul Co., New York.
- 9) An Introduction to Fungi.-- H. C. Dube, 1990. Vikas Publishing House Pvt. Ltd., Delhi.



CHOICE BASED CREDIT SYSTEM

B.Sc. - I: Botany

Paper - I “Biodiversity in Cryptogams and Gymnosperms”

(DSC – 1007 A)

Section II: Bryophytes, Pteridophytes and Gymnosperms (Archegoniate)

Course Outcomes: On completion of the course, students will be able to:

CO1: Understand identify and classify bryophytes, pteridophytes and gymnosperms.

CO 2: Understand classification of bryophytes, pteridophytes and gymnosperms.

CO3: Know the sustainable utilization of these plants to the society.

CO 4: Know general characters of bryophytes , pteridophytes and gymnosperm.

Paper II	DSC 1007 A :“Biodiversity in Cryptogams and Gymnosperms” Section : II (DSC 1007A2): Bryophytes, Pteridophytes and Gymnosperms (Archegoniate)	No. of Hours per Unit / Credit
Unit : I.	<p>Bryophytes and Pteridophytes 1a. Bryophytes: General characters, Adaptation to land habit, Classification (As per G. M. Smith) up to class, Alternation of Generation, Economic importance. Morphology, Anatomy and Life Cycle (Excluding developmental stages) a. Hepaticopsida - <i>Riccia</i> b. Anthocerotopsida- <i>Anthoceros</i></p> <p>1b. Pteridophytes: General characters, Classification (As per G. M. Smith) upto class. Morphology, Anatomy & Life Cycle (Excluding developmental stages) of a. Lycopsida- <i>Selaginella</i> b. Pteropsida - <i>Pteris</i> c. Heterospory and seed habit in Pteridophytes</p>	20 hrs (10 hrs.) (10 hrs.)
Unit . II.	<p>Gymnosperms : 2a .General characters, Classification (As per Sporne, 1965) upto Class General characters of class with suitable examples. Economic importance of gymnosperms. 2b. Morphology, Anatomy and Life Cycle (Excluding developmental stages) of <i>Cycadopsida- Cycas</i>. 2c. Evolutionary significance of Gymnosperm.</p>	10 hrs

Total hours: 30



CHOICE BASED CREDIT SYSTEM

References:

- 1) Bryophytes. P. Puri, 1985. Amarm & Sons, Delhi.
- 2) College Botany - S. Sundararajan (1999)
- 3) College Botany Vol. I - H. C. Gangulee, Das K. S. and Datta C. T. (1991)
- 4) College Botany Vol. II - H. C. Gangulee and Kar A. K. (1999)
- 5) College Botany Vol. III -- S. K. Mukharji (1990)



CHOICE BASED CREDIT SYSTEM

B.Sc. - I: Botany

Paper – II “Plant Ecology and Angiosperm Taxonomy”

(DSC – 1007 B)

Section I: Plant Ecology

Course Outcomes: On completion of the course, students will be able to:

CO1: Understand the basic components of ecology.

CO 2: Understand various species interactions.

CO3: Understand ecological succession.

CO 4: Understand ecosystem and phytogeography.

Paper II	DSC 1007 B “Plant Ecology and Taxonomy” Section : I (DSC 1007B1): Plant Ecology	No. of Hours per Unit / Credit
Unit : I.	Ecological factors and Plant communities : 1a. Introduction and definition of Ecology 1b. Ecological factors: i. Edaphic factors- Soil: Origin and formation. Composition- soil water, soil air, soil temperature, soil organic matter and soil microbes. ii. Climatic factors- Light , Temperature, Precipitation , atmospheric humidity and Rainfall iii. Ecological adaptations – Hydrophytes , Xerophytes, Epiphytes and Parasites iv. Soil Pollution - Preventive and Curative methods 1c Ecological Succession Introduction, Process of succession , Types of succession - Hydrosere , Xerosere. 1d Ecological Interaction Intraspecific interaction (Cooperation, communication, competition) and Interspecific interaction (Symbiosis , Commensalism , Parasitism and Predation).	15 hrs
Unit . II.	Ecosystem and Phyto-geography 2a. Ecosystem Introduction, Composition- Abiotic and Biotic components. Types of ecosystems – Aquatic and Terrestrial (one example of each type) Food chain and web. 2b. Biogeochemical cycles- Introduction, Phosphorus and Nitrogen cycle. 2c. Phytogeographical regions of India (as per Chatterjee and Mani).	15 hrs



Total hours: 30

CHOICE BASED CREDIT SYSTEM

References:

- 1) A Text Book of Plant Ecology. -- R.S. Ambasth. 1988 Students Friends Co. Varanasi.
- 2) Ecology: Principles and Applications - J.L. Chapman and M.J. Reiss, 1995. Cambridge University Press.
- 3) Fundamentals of Ecology. -- M.C. Dash, 1993. Tata McGraw Hill Publishing Co. Ltd., New Delhi.
- 4) Plant Ecology-- J. E. Weaver and F. E. Clements. 1966. Tata McGraw Publishing Co. Ltd. Bombay.
- 5) Methods in Plant Ecology.-- P. W. Moore and S. B. Chapman, 1986. Blackwell Scientific Publication.



CHOICE BASED CREDIT SYSTEM

B.Sc. - I: Botany

Paper – II “Plant Ecology and Angiosperm Taxonomy”

(DSC – 1007 B)

Section II: Angiosperm Taxonomy

Course Outcomes: On completion of the course, students will be able to:

CO1: Understand the morphology of flowering plant.

CO 2: Understand the classification of flowering plant.

CO 3: Understand the morphological, floral, distinguishing characters and economic importance of families.

CO 4: Understand the classification system of flowering plant.

Paper II	DSC 1007 B “Plant Ecology and Taxonomy” Section : II (DSC 1007B2): Taxonomy	No. of Hours per Unit / Credit
Unit : I.	Plant Taxonomy : 1a. Salient features of Angiosperms. 1b. Introduction and Importance of taxonomy 1c. Functions of taxonomy - Identification, Nomenclature and classification. Binomial nomenclature. 1d. Salient features of International Code of Botanical Nomenclature (ICBN). 1e. Bentham and Hooker’s system of classification with merits and demerits. 1f. Morphological, floral, distinguishing characters and economic importance of following families. i. Malvaceae ii. Solanaceae iii. Nyctaginaceae iv. Amaryllidaceae	18 hrs
Unit . II.	Morphology and modifications in Angiosperms: 2a. Morphology and modification of Root. 2b. Morphology and modification of Stem. 2c. Morphology and modification of Leaf.	12 hrs

Total hours: 30



CHOICE BASED CREDIT SYSTEM

References:

- 1) Principles of Angiosperm Taxonomy – P. H. Davis, Heywood V. M. (1963)
- 2) The evolution and classification of flowering plants. – A. Cronquist, 1968. Thomas Nelson(Printers) Ltd., London & Edinburgh.
- 3) Plant Diversification. --Delevoryas, Th. 1965 Modern Biology Series, Half Rinehart&Winston, New York.
- 4) Comparative Morphology of Vascular Plants. - A. S. Foster and Gifford, A.E.M. jr. 1967. Vakils, Peffer & Simons Pvt., Ltd.
- 5) The Morphology of Angiosperms. -- K.R Sporne, 1977. B.I. Publication, Bombay.



CHOICE BASED CREDIT SYSTEM

B.Sc. Part I CBCS syllabus with effect from 2018 -2019

Botany

PRACTICAL (Based on Paper I & II)

1. Study of Forms of bacteria
2. Study of *Nostoc*
3. Study of *Spirogyra*
4. Study of *Mucor*
- 5. Study of Diatoms**
6. Study of *Penicillium*
7. Study of VAM fungi
8. Study of *Riccia*
9. Study of *Anthoceros*
10. Study of *Selaginella*
11. Study of *Pteris*
12. Study of *Cycas*
13. Algal biofertilizer
13. Study of Water Holding Capacity of different soils
14. Determination of soil pH by Universal Indicator/ pH paper/ pH meter
15. Study of morphological and anatomical adaptations in hydrophytes- *Hydrilla, Eichhornia*.
16. Study of morphological and anatomical adaptations in Xerophytes- *Aloe, Nerium*.
17. Study of morphological and anatomical adaptations in Epiphytes (Orchid) and Parasites(*Cuscuta*).
18. Study of morphology and modification of Root.
19. Study of morphology and modification of Stem.
20. Study of morphology and modification of Leaf.
- 21- 24. Study of Vegetative and Floral characters of following plant families Malvaceae, Solanaceae, Nyctaginaceae and Amaryllidaceae



CHOICE BASED CREDIT SYSTEM

Distribution of Marks for B. Sc. I- BOTANY Practical

Sr. No.	Name of topic	Marks
1.	Bacteria / Lichen /VAM/Biofertilizer	04
2.	Algae	04
3.	Fungi	04
4.	Bryophyte	04
5.	Pteridophytes/ Gymnosperms	06
6.	Ecology	06
8.	Angiosperm	06
9.	Taxonomy	06
9.	Journal	05
10.	Tour report	05
		50



CHOICE BASED CREDIT SYSTEM

Details of Practical Examination

A) Every candidate must produce a certificate- from Head of the Dept. in his /her college, stating that he /she has completed practical course in satisfactory manner as per guidelines laid down by Academic Council on the recommendations of Board of Studies in Botany. The student should record his / her observations and report of each experiment should be written in the journal. The journal is to be signed periodically by teacher in charge and certified by the Head of the Department at the end of year. Candidates have to produce their certificate journal and tour report at the time of practical examination. Candidate is not "allowed to appear" for the practical examination without a certified journal / a certificate from Head of the Botany Dept. regarding the same.

B) Practical Examination shall be of Five hours duration and shall test a candidate in respect of the following.

1. Practical study of external and internal structures of different plant types and their classification. Making temporary stained preparations and identification.
2. Identification and setting of physiological and biochemical experiments.
3. Study of plant families as per syllabus,
4. Spotting of the specimens as per syllabus.

Botanical Excursions

One teacher along with a batch not more than 20 students be taken for botanical excursion to places of Botanical interest (Nursery, Botanical garden, Polyhouse). If there are female students in a batch of twenty students, one additional lady teacher is permissible for excursion. Each excursion will not be more than three days during college working days. T.A. and D.A. for teachers and non-teaching staff participating in excursions should be paid as per rules. Tour report duly certified by teacher concerned and Head of the Department should be submitted at the time of practical examination.



CHOICE BASED CREDIT SYSTEM

B.Sc. I (Sem. I & II) Botany

Evaluation Pattern

With effect from 2018-19

Paper No.	Title of the paper	Course Code	Semester End Examination	Continuous Internal Evaluation Marks	Total Marks
I - Sec. I	Biodiversity in Microbes, Algae, Fungi	DSC 1007A1	35	15	50
I - Sec. II	Bryophytes, Pteridophyte and Gymnosperms	DSC1007A2	35	15	50
II - Sec. I	Plant Ecology	DSC1007B1	35	15	50
II - Sec. II	Angiosperm Taxonomy	DSC1007B2	35	15	50



CHOICE BASED CREDIT SYSTEM

B.Sc. I (Sem. I & II) Botany

Semester End Examination

Structure of Question Paper

Total Marks: 35

Time: 2 hours

Question No.	Question Pattern	Marks
Q.1	A) Select correct alternative. (MCQ). B) Fill in the blanks.	05 02
Q.2	Attempt any two. (Long answer questions).	16
Q.3	Attempt any four. (Short notes).	12
	Total	35

B.Sc. I (Sem. I & II) Botany

Continuous Internal Evaluation (CIE)

Evaluation Type	Marks
Home Assignment/Book Review/ Student Project/Test/PPT Presentation	15

