

“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**

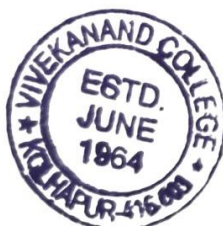
**B.Sc. Part - I BOTANY**

**(Semester-I & II)**

**Under Choice Based Credit System**

**CBCS Syllabus to be implemented from 2018 – 2019**

(Subject to modifications in the future)



**CHOICE BASED CREDIT SYSTEM**

**B.Sc. I (Sem. – I and II) Botany**

**Course Structure**

<b>Paper No.</b>	<b>Course Code</b>	<b>Title of Paper</b>	<b>No. of Credits</b>
<b>Semester I</b>			
I	DSC -1007A	<b>Biodiversity in Cryptogams and Gymnosperms</b>	04
<b>Semester II</b>			
II	DSC-1007B	<b>Plant Ecology and Taxonomy</b>	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.	<b>Microbes: :</b> <b>1a: Virus:</b> Discovery, General Characters, DNA virus (T Phage) and RNA virus (TMV),Economic importance. <b>1b. Bacteria-</b> Discovery, General Characters, Cell structure, Types, Mode of reproduction Asexual ( Binary fission & Budding), Sexual (Conjugation), Economic importance.	07 hrs.
Unit : II.	<b>Algae and Fungi:</b> <b>2a. Algae:</b> General Characters, Classification (As per G. M. Smith) up to class. Morphology and Life Cycle (Excluding developmental stages) of a. Cyanophyceae- <i>Nostoc</i> b. Chlorophyceae- <i>Spirogyra</i> c. Algal biofertilizers and its importance <b>2b. Fungi:</b> 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	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. Vikas Publishing House Pvt. Ltd., Delhi.
- 6) Morphology of Plants and Fungi -- H.C. Blod, Aloxopoulos, G. J. and Delevoryas, T. 1980.(4th Edition) Harper and Foul Co., New York.
- 7) Introductory Phycology. H. D. Kumar, 1988, Affiliated East-West Press Ltd., New York.



## 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.

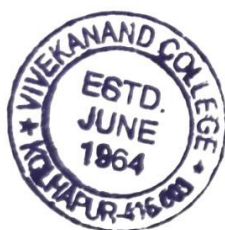
CO 2: Understand classification of bryophytes, pteridophytes and gymnosperms.

CO 3: 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><b>Bryophytes and Pteridophytes</b>  <b>1a. Bryophytes:</b>                      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><b>1b. Pteridophytes:</b>                      General characters, Classification (As per G. M. Smith) upto class. Morphology, Anatomy &amp; Life Cycle (Excluding developmental stages) of                      a. Lycopsidea- <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><b>Gymnosperms :</b>  <b>2a .</b>General characters, Classification (As per Sporne, 1965) upto Class General characters of class with suitable examples. Economic importance of gymnosperms.  <b>2b.</b> Morphology, Anatomy and Life Cycle (Excluding developmental stages) of <i>Cycadopsida- Cycas</i>.</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 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.	<b>Ecological factors and Plant communities :</b> 1a. Introduction and definition of Ecology 1b. Ecological factors: <b>i. Edaphic factors-</b> Soil: Origin and formation. Composition- soil water, soil air, soil temperature, soil organic matter and soil microbes. <b>ii. Climatic factors-</b> Light , Temperature, Precipitation , atmospheric humidity and Rainfall <b>iii. Ecological adaptations</b> – Hydrophytes , Xerophytes, Epiphytes and Parasites <b>iv. Soil Pollution</b> - Preventive and Curative methods 1c <b>Ecological Succession</b> Introduction, Process of succession , Types of succession - Hydrosere , Xerosere. 1d <b>Ecological Interaction</b> Intraspecific interaction ( Cooperation, communication, competition ) and Interspecific interaction ( Symbiosis , Commensalism , Parasitism and Predation).	15 hrs
Unit . II.	<b>Ecosystem and Phyto-geography</b> 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. Ambasht. 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) Methods in Plant Ecology.-- P. W. Moore and S. B. Chapman, 1986. Blackwell Scientific Publication.
- 5) Plant Ecology-- J. E. Weaver and F. E. Clements. 1966. Tata McGraw Publishing Co. Ltd. Bombay.





## CHOICE BASED CREDIT SYSTEM

### B.Sc. - I: Botany

#### Paper – II “Plant Ecology and Taxonomy”

(DSC – 1007 B)

#### Section II : 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.

<b>Paper II</b>	<b>DSC 1007 B “Plant Ecology and Taxonomy”</b> <b>Section : II (DSC 1007B2): Taxonomy</b>	<b>No. of Hours per Unit / Credit</b>
Unit : I.	<b>Plant Taxonomy :</b> 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.	<b>Morphology and modifications in Angiosperms:</b> 2a. Morphology and modification of Root. 2b. Morphology and modification of Stem. 2c. Morphology and modification of Leaf.	12 hrs

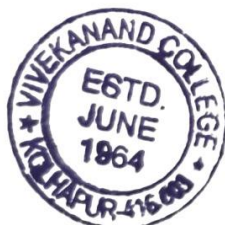
**Total hours: 30**



## CHOICE BASED CREDIT SYSTEM

### References:

- 1) Comparative Morphology of Vascular Plants. - A. S. Foster and Gifford, A.E.M. jr. 1967. Vakils, Peffer & Simons Pvt., Ltd.
- 2) Principles of Angiosperm Taxonomy – P. H. Davis, Heywood V. M. (1963)
- 3) The evolution and classification of flowering plants. – A. Cronquist, 1968. Thomas Nelson(Printers) Ltd., London & Edinburgh.
- 4) Plant Diversification. --Delevoryas, Th. 1965 Modern Biology Series, Half Rinehart&Winston, New York.
- 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 *Penicillium*
6. Study of VAM fungi
7. Study of *Riccia*
8. Study of *Anthoceros*
9. Study of *Selaginella*
10. Study of *Pteris*
11. Study of *Cycas*
12. 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

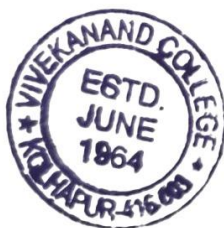
A) Every candidate must produce a certificate- from Head of the Dept. in his /her college, stating that he /she has completed practical course in satisfactory manner as per guidelines laid down by Academic Council on the recommendations of Board of Studies in Botany. The student should record his / her 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	40	10	50
I - Sec. II	Bryophytes, Pteridophyte and Gymnosperms	DSC1007A2	40	10	50
II - Sec. I	Plant Ecology	DSC1007B1	40	10	50
II - Sec. II	Taxonomy	DSC1007B2	40	10	50



**CHOICE BASED CREDIT SYSTEM**

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

**Semester End Examination**

**Structure of Question Paper**

**Total Marks: 40**

**Time: 2 hours**

Question No.	Question Pattern	Marks
Q.1	Select correct alternative. (MCQ).	08
Q.2	Attempt any two. (Long answer questions).	16
Q.3	Attempt any four. (Short notes).	16
	Total	40

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

**Continuous Internal Evaluation (CIE)**

Evaluation Type	Marks
Home Assignment/Book Review/ Student Project/Test/PPT Presentation	10

