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BENGALURU
CITY UNIVERSITY

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BE BOUNDLESS

BANGALORE CITY UNIVERSITY

DEPARTMENT OF BOTANY

SYLLABUS FOR

B.Sc. BOTANY (UG)

III & IV SEMESTERS

Choice Based Credit System (CBCS PATTERN)

Framed According to the National Educational Policy

(NEP 2020)

To be implemented from the academic year

2022-23

Proceedings of the meeting of BOS (UG) in Botany held on 7th September 2022 at Board Room, CBSMS, Central College Campus, Bangalore City University, Bengaluru – 560 001

Venue: Board Room, CBSMS, Central College Campus, Bangalore City University, Bengaluru – 560 001

Date: 07/09/2022 Time: 11:00 AM

Agenda:

1. To finalize the syllabus for III and IV Semester B.Sc. Botany (UG) (CBCS) NEP-2020 for approval.
2. To approve the panel of examiners recommended for the examinations of 2022-23.
3. To recommend and approve the constitution of BoE for the academic year 2022-23.

Members Present		Signature
1. Smt. Zaiba Nishanth Banu	Member	
2. Dr. Mallikarjuna P.B.	Member	
3. Dr. B. L. Manjula	Member	
4. Smt. K. R. Kavitha	Member	7/9/2022
5. Smt. N. Sarvamangala	Member	
6. Smt. K.S. Shailaja	Member	
7. Smt. Chandrakala S	Member	7/9/22
8. Dr. (Smt.) Anitha P	Co-opted Member	ABSENT
9. Dr. L. Rajanna	Chairman	7/9/2022

Members Absent

1. Dr. Jenifer Lolitha Member

MINUTES OF THE MEETING OF BoS (UG) IN BOTANY

Chairman welcomed the members of the BoS (UG) to the meeting and the agenda was placed for discussion.

a). Discussed and finalized the theory and practical syllabus of III and IV Semester B.Sc., Botany (CBCS), question paper pattern, blue print of question paper Formative assessment and Scheme of valuation for NEP programme to be implemented from the academic year 2022-23.

b). The panel of Examiners was approved and recommended for UG Examination for the academic year 2022-23.

c). Recommendations were made to constitute BoE for the academic year 2022-23.

d). The Chairman was authorized to change / incorporate the corrections as per the directions of Bangalore City University.

The meeting ended with a vote of tanks by the Chairman.

1 K.R. Kavitha

2 Shailaja J.S. Sli

3 N. SARVAMANGALA. N. Sarvamangala

4 ZAIBA NISHATH BANO Zai BB

5 Dr. P.B. Mallikarjuna, Associate Professor, GFGC Yelahanka-64, PB M

6 Dr. B.L. Manjula, Associate Professor, SJRC, Race Course road, B'lore-9 Manjula

7 Chandrakala. S. Assistant professor, SJRCW,

8. Dr. L. Rajanna Rajajinagar, B'lore-
07/9/2022 7/9/22.

Karnataka State Higher Education Council

BOTANY Syllabus Framing Committee

Sl No	Name	Designation	Signature
1.	Prof. G R Naik, Vice Chancellor, Garden City University, Bengaluru	Chairperson	
2.	Dr. A. H. Rajasab, Pro Vice Chancellor, KNB University, Kalaburagi	Member	
3.	Dr. G.R. Janardhana, Professor, University of Mysore, Mysuru	Member	
4.	Dr. H. Niranjanamurthy, Professor, Karnataka University, Dharwad	Member	
5.	Dr. L. Rajanna, Professor, Bangalore University, Bengaluru	Member	
6.	Dr. Krishna Kumar G, Professor, Mangalore University, Konaje	Member	
7.	Dr. M.B. Shivanna, Professor, Kuvempu University, Shivamogga	Member	
8.	Dr. Govindappa M, Professor, Davangere University, Davangare	Member	
9.	Dr H.Ramakrishnaiah, Registrar and Associate Professor, Maharani Cluster University, Bengaluru	Member	
10.	Shri. M. N. Mallikarjunaiah, Associate Professor, Mandya University, Mandya	Member	
11.	Shri. Rangaswamy R.K. Government Science College, Chitradurga	Member	
12.	Dr. Abdul Khayum, Associate Professor, Government Women's College, Kolar	Member	
13.	Dr. Mamtha, Associate Professor, Government First Grade College,Bengaluru	Member	
14.	Dr. Jayakara Bhandary, Associate Proessor, Government First Grade College, Mangalore	Member	
15.	Dr. R.J. Katti, Associate Professor, Kittel College Dharwad	Member	
16.	Shri L.S. Ramesh, Special Officer, Karnataka State Higher Education Council	Member Convener	

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COURSE PATTERN AND SCHEME OF EXAMINATION FOR B.SC. / B.SC. (HONS.) AS PER NEP (2022-23 ONWARDS)																
SUBJECT : BOTANY																
Sl. No	Semester	Title Of The Paper	Teaching Hours	Hours/Week		Examination pattern Max. and Min. Marks/Paper						Duration of exam (hours)		Total marks/ paper	Credits	
						Theory			Practical							
				Theory	Practical	Max.	Min.	IA	Max.	Min.	IA	Theory	Practical		Theory	Practical
1	III	CORE SUBJECT	56	4	4	60	21	40	25	09	25	3	4	150	4	2
		OPEN ELECTIVE	42	3	-	60	21	40	-	-	-	3	-	100	3	-
		SKILL ENHANCEMENT COURSE	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	IV	CORE SUBJECT	56	4	4	60	21	40	25	09	25	3	4	150	4	2
		OPEN ELECTIVE	42	3		60	21	40				3	-	100	3	-
		SKILL ENHANCEMENT COURSE	-	-	-	-	-	-	-	-	-	-	-	-	-	-

B.Sc. BOTANY: Semester - 3

Theory: Discipline Specific Core Course (DSCC)

Title of the Course and Code:

BOT-A-3.1: PLANT ANATOMY AND DEVELOPMENTAL BIOLOGY

Course code	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/ Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
BOT-A-3.1	DSCC	Theory	04	04	56 Hrs.	3 Hrs.	40	60	100

Course Outcomes:

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

1. Observation of variations that exist in internal structure of various parts of a plant and as well as among different plant groups in support for the evolutionary concept.
2. Skill development for the proper description of internal structure using botanical terms, their identification and further classification.
3. Induction of the enthusiasm on internal structure of locally available plants.
4. Understanding various levels of organization in a plant body with an outlook in the relationship between the structure and function through comparative studies.
5. Observation and classification of the floral variations from the premises of college and house.
6. Understanding the various reproductive methods sub-stages in the life cycle of plants
7. Observation and classification of the embryological variations in angiosperms.
8. Enthusiasm to understand evolution based on the variations in reproduction among plants.

PLANT ANATOMY

Unit 1: ANGIOSPERM ANATOMY AND PLANT TISSUES: 14 Hrs.

Introduction, objectives and scope of Plant Anatomy, Plant primary and secondary cell wall structure.

Tissue and tissue systems - Meristematic tissue, permanent tissue and secretary cells.

Classification of meristem: (apical, intercalary and lateral), primary and secondary meristems.

Apical meristem*:* Theories on organization of meristem (apical cell theory, Tunica-Corpus theory, histogen theory and Korper-Kappe theory).Quiescent centre, Root cap.

Unit II: DIFFERENTIATION 14 Hrs.

Differentiation of root, stem and leaf.

Types of vascular bundles and Vascular cambium

Structure of Dicot root: primary (*Tridax* and *Cicer)*.

Structure of monocot root (Maize).

Structure of Dicot stem: Primary and secondary growth (*Tridax* and *Cicer*).

Structure of Monocot stem (Maize).

Structure of Dicot and Monocot leaf: primary structure (*Tridax* and Maize), Stomatal types.

Anomalous secondary growth: *Boerhaavia* (dicot stem) and *Dracaena* (monocot stem)

DEVELOPMENTAL BIOLOGY

Unit III: MORPHOGENESIS 14 Hrs.

Differentiation, cell polarity and symmetry in unicellular and multicellular systems
Shoot Apical meristem (SAM): Origin, structure and function
Organogenesis: Differentiation of root, stem, leaf and axillary buds.
Mechanism of leaf primordium: initiation & development
Structure and function of root apical meristem (RAM): Root cap, quiescent centre and origin of lateral roots.
Transition from vegetative apex into reproductive apex.
Developmental patterns at flowering apex: ABC model specification of floral organs.

Unit IV: REPRODUCTIVE BIOLOGY 14 Hrs.

Introduction, Scope and contributions of Indian embryologists: P. Maheshwari and B G L Swamy.

Microsporangium: Structure and Development of anther,
Tapetum – Types, structure and functions and sporogenous tissue.
Microsporogenesis - Microspore mother cell, microspore tetrads, massulae and Pollinia.
Microgametogenesis – Formation of vegetative and generative cells,
Structure of male gametophyte. Pollen embryo sac (Nemec phenomenon).

Megasporangium – Structure of typical Angiosperm ovule (Anatropous).
Types of ovules- Anatropous, Orthotropous, Amphitropous and Circinotropous.
Megagametogenesis – Types of development of Female gametophyte/embryo sac-
Monosporic- *Polygonum* type, Bisporic – *Allium* type, Tetrasporic - *Fritillaria* type.
Structure of mature embryo sac.

Pollination and fertilization: Structural and functional aspects of stigma and style,
Double fertilization and its significance. Post fertilization changes.

Endosperm – Types and its biological importance. Free nuclear (*Cocos nucifera*)
Cellular (*Cucumis),* Helobial types and Ruminate endosperm.

Embryogenesis – Dicot (*Capsella bursa-pastoris)* embryo development.
A brief account of seed development.

B.Sc. BOTANY: Semester – 3

Practical: Discipline Specific Core Course (DSCC)
Title of the Course and Code:
BOT-A-3.2: PLANT ANATOMY AND DEVELOPMENTAL BIOLOGY

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/ Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
BOT-A-3.2	DSCC	Practical	02	04	52 hrs	3hrs	25	25	50

LIST OF EXPERIMENTS TO BE CONDUCTED

Practical No.1

Study of meristem (Permanent slides/ Photographs).
Study of Simple Tissues (Parenchyma, Collenchyma and Sclerenchyma)
Complex tissues (xylem and phloem).

Practical No.2

Maceration technique to study elements of xylem and phloem, Study of primary structure of dicot root, stem and leaf (*Tridax*) and monocot root, stem and leaf (Maize) Permanent slides.

Practical No.3

Study of Normal secondary growth structure in dicot stem and root (*Tridax*).
Anomalous secondary growth: *Boerhavia* (dicot stem) and *Dracaena* (monocot stem).

Practical No. 4

Study of trichomes (any three types) and stomata (any three types) with the help of locally available plant materials.

Practical No. 5

Permanent slides of Microsporogenesis and male gametophyte. Mounting of Pollen grains (Grass and *Hibiscus*) and Pollinia of *Calotropis*.

Practical No. 6

Pollen germination (hanging drop method) and effect of Boron and Calcium on pollen germination.

Practical No. 7

Permanent slides of types of ovules, Megasporogenesis and embryo sac development
Types of placentation: Axile, Marginal and Parietal. Sectioning of ovary (for the studied types of placentation).

Practical No. 8

Mounting of embryo: *Tridax* and *Cyamopsis*, Mounting of endosperm: *Cucumis*.

Practical No. 9, 10 and 11

Mini project work in groups of 3-5 students, from the following list

a) Study of pollen morphology of different flowers with respect to shape, colour and apertures etc.,
b) Pollen germination of different pollen grains and calculate the percentage of germination.
c) Calculating percentage of germination of one particular type of pollen grain collected from different localities/ under different conditions.
d) Study of placentation of different flowers.
e) Any other relevant study related to Anatomy / Embryology.

(**Typed report to be submitted**)

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2. Bhojwani Sant Saran, (2014). Current Trends in the Embryology of Angiosperms**,** Woong-Young Soh, Springer Netherlands,
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(DSCC)

SCHEME OF BOTANY PRACTICAL EXAMINATION
III SEMESTER: PAPER BOT-A-3.2

MODEL QUESTION PAPER

Title of the Paper: PLANT ANATOMY AND DEVELOPMENTAL BIOLOGY

Time: 3 Hours **Max Marks- 25**

I. Prepare a temporary stained slide of the given material **A**, leave the preparation for Evaluation. **05 Marks**
(Dicot/Monocot: Root/ Stem)
(Preparation 1 Mark, Identification 1Mark, labelled diagram 1 Mark, Reasons-2 Marks)

II. Identify the given slides **B, C, D & E** **4X2 = 08 Marks**
(**B** from Tissues, **C, D** from Anatomy, **E** from Embryology)
(Identification-½ Mark, Diagram ½ Mark, reasons 1 Mark)

III. Mount the material **F** and comment **02 Marks**
(Pollen grain/Stomata/Trichomes)
(Mounting - 1 Mark, Diagram ½ Mark, Reasons-½ Mark)

1V. Mount the material **G** (Endosperm / Embryo) and comment / Perform pollen germination.
(Preparation 1 Mark, Diagram 1 Mark, reasons 1 mark) **03 Marks**

V. VIVA VOCE…….. 02 Marks

Mini Project……. 02 Marks

Practical record……. 03 Marks

(DSCC)

SCHEME OF BOTANY THEORY EXAMINATION III SEMESTER: PAPER BOT-A-3.1

MODEL QUESTION PAPER

Title of the Paper: PLANT ANATOMY AND DEVELOPMENTAL BIOLOGY

Time: 2½ Hours **Max Marks- 60**

Instructions: Draw neat labelled diagrams wherever necessary

I. Define/Explain any Four of the following: 2X4=8 Marks

1.
2.

3.

4.

5.

6.

II. Answer any Four of the following: 5X4=20 Marks

7.
8.

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12.

III. Answer any Four of the following: 8X4=32 Marks

13.
14.

15.

16.

17.

18.

B.Sc. BOTANY – III Semester

Open Elective Course (OEC-3) (OEC for other students)

Paper: Landscaping and Gardening

Code: OEC-3.3

Course code	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
OEC-3.3	OEC	Theory	03	03	42 hrs	2 hrs	40	60	100

Learning outcomes:

After the completion of this course the learner will be able to:

- Apply the basic principles and components of gardening
- Conceptualize flower arrangement and bio-aesthetic planning
- Design various types of gardens according to the culture and art of bonsai
- Distinguish between formal, informal and free style gardens
- Establish and maintain special types of gardens for outdoor and indoor landscaping

Unit I **14 Hrs.**

Principles of gardening, garden components, adornments, methods of designing rockery, water garden, etc. their walk-paths, bridges, constructed features. Special types of gardens, trees, their design, values in landscaping, propagation, planting shrubs and herbaceous perennials. Importance, design values, propagation, planting of climbers and creepers, palms, ferns, grasses and cacti succulents.

Unit II **14 Hrs.**

Flower arrangement: importance, production details and cultural operations, constraints, post-harvest practices. Bio-aesthetic planning: definition, need, round country planning, urban planning and planting avenues, schools, villages, beautifying railway stations, dam sites, hydroelectric stations, colonies, river banks, planting material for play grounds.

Unit III **14 Hrs.**

Vertical gardens and public gardens. Landscape designs, Styles of garden, formal, informal and freestyle gardens, types of gardens, Urban landscaping, Landscaping for specific situations, institutions, industries, residents, hospitals, road sides, traffic islands, dam sites, IT parks and corporate. Establishment and maintenance, Bio-aesthetic planning, eco-tourism, therapeutic gardening, non-plant components, water-scaping, xeri-scaping, hard-scaping; outdoor and indoor scaping, exposure to CAD (Computer Aided Designing).

REFERENCES:

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3. Sudhir Pradhan (2018). Landscape gardening. Scientific Publishers India.
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B.Sc. BOTANY: Semester - 4

Theory: Discipline Specific Core Course (DSCC)

Title of the Course and Code:

BOT-A-4.1: ECOLOGY AND CONSERVATION BIOLOGY

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures / Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
BOT-A-4.1	DSCC	Theory	04	04	56 hrs	3hrs	40	60	100

Course Outcomes:

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

1. Understanding the fundamental concepts in ecology, environmental science and phytogeography.
2. Concept development in conservation, global ecological crisis, Sustainable development and pros and cons of human intervention.
3. Enable the student to appreciate bio diversity and the importance of various conservation strategies, laws and regulatory authorities and global issues related to climate change and sustainable development.

ECOLOGY

Unit 1: INTRODUCTION TO ECOLOGY AND CONSERVATION BIOLOGY: 14 Hrs.

Definition, Principles of Ecology, Brief history, Major Indian Contributions, Scope and importance.

Ecological factors: Climatic factors: light, temperature, precipitation and humidity.

Edaphic factors: Soil and its types, soil texture, soil profile, soil formation; physico-chemical properties of soil - mineral particles, soil pH, soil aeration, organic matter, soil humus and soil microorganisms.

Topographic Factors: Altitude.

Ecological groups of plants and their adaptations: Morphological and anatomical adaptations of hydrophytes, xerophytes, epiphytes and halophytes.

Unit 2: ECOSYSTEM ECOLOGY: 14 Hrs.

Introduction, types, Biotic and Abiotic components and structure of ecosystems with examples -terrestrial and Aquatic.

Ecosystem functions and processes: Food chain and Food web. Ecological pyramids – Pyramids of number, energy and biomass. Energy flow in ecosystem.

Ecological succession: Definition, types - primary and secondary. General stages of succession. Hydrosere and xerosere.

Community Ecology: Community and its characteristics – frequency, density, Abundance, cover and basal area, phenology, stratifications, life-forms. Concept of Ecotone and Ecotypes. Intra-specific and Inter-specific interactions with examples.

Ecological methods and techniques: Methods of sampling plant communities – transects and quadrat. Remote sensing as a tool for vegetation analysis, land use – land cover mapping.

Unit 3: PHYTOGEOGRAPHY AND ENVIRONMENTAL ISSUES: 14 Hrs.

Theory of continental drift. Centres of origin of crop plants – Vavilov's concepts. Phytogeographical regions of India.

Vegetation types of Karnataka – Composition and distribution of evergreen, semi-evergreen, deciduous, scrub, mangroves, shola forests and grasslands.

An account of the vegetation of the Western Ghats of Karnataka.

Pollution: Water pollution: Types, causes and effects; water quality indicators, water quality standards in India and control of water pollution (Waste water treatment).

Water pollution disasters – National mission on clean Ganga, Handigudu and Minimata

Air pollution: Causes, effects, air quality standards, acid rain and control.

Soil pollution: Causes, effects, solid waste management and control measures of soil pollution.

Unit 4: BIODIVERSITY AND ITS CONSERVATION: 14 Hrs.

Biodiversity: Definition, types of biodiversity - habitat diversity, species diversity and genetic diversity, Sustainable Development Goals (SDG's) in biodiversity conservation.

Values of Biodiversity – Economic and aesthetic value, Medicinal and timber yielding plants. NTFP. Threats to biodiversity.

Concept of Biodiversity hotspots.

Concept of endemism and endemic species.

ICUN plant categories with special reference to Karnataka/ Western Ghats.

Conservation methods – *In-situ* and *ex-situ* conservation

In-situ methods –Biosphere reserves, National parks, Sanctuaries and Sacred grooves.

Ex-situ methods-Botanical gardens, Seed bank, Gene bank and Pollen bank Cryopreservation.

B.Sc. BOTANY: Semester – 4

Practical: Discipline Specific Core Course (DSCC)

Title of the Course and Code:

BOT-A-4.2: ECOLOGY AND CONSERVATION BIOLOGY

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/ Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
BOT-A-4.2	DSCC	Practical	02	04	52 hrs	3hrs	25	25	50

LIST OF EXPERIMENTS TO BE CONDUCTED

Practical No.1

Determination of pH of different types of Soils. Estimation of salinity of soil/water.

Practical No.2

Study of Ecological instruments – Wet and Dry thermometer, Altimeter, Hygrometer, Soil thermometer, Rain Gauge, Barometer, etc.

Practical No.3

Hydrophytes: Morphological adaptations in *Pistia, Eichhornia, Hydrilla, Nymphaea.*Anatomical adaptations in *Hydrilla*(stem) and *Nymphaea* (petiole).

Practical No. 4

Xerophytes: Morphological adaptations in *Asparagus, Casuarina, Acacia, Aloe vera, Euphorbiatirucalli.* Anatomical adaptations in phylloclade of *Casuarina*

Practical No. 5

Epiphytes: Morphological adaptations in *Acampe, Bulbophyllum, Drynaria*. Anatomical adaptations in epiphytic root of *Acampe/ Vanda.*Halophytes: Morphology and anatomy of Pneumatophores.

Practical No. 6

Study of a pond/forest ecosystem and recording the different biotic and abiotic components.

Practical No. 7

Demonstration of different types of vegetation sampling methods – transects and quadrats. Determination of Density and frequency.

Practical No. 8

Application of remote sensing to vegetation analysis using satellite imageries

Practical No. 9

Field visits to study different types of local vegetations/ecosystems and the report to be written in practical record book.

Practical No. 10

Determination of water holding capacity of soil samples

Practical No. 11

Determination of Biological oxygen demand (BOD)

Practical No. 12

Determination of Chemical oxygen demand (COD).

Practical No. 13

Determination of soil texture of different soil samples.

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DSCC

SCHEME OF BOTANY PRACTICAL EXAMINATION IV SEMESTER BOT-A-4.2

MODEL QUESTION PAPER

Title of the Paper: ECOLOGY AND CONSERVATION BIOLOGY

Time: 3 Hours **Max Marks- 25**

I. Conduct the BOD/COD of Water sample **A.** **06 Marks**
(Requirement and procedure -2,Marks, Principle 1Mark, Conducting -2 marks, Result – 1 Mark)

II. Write the ecological adaptations of **B ,C & D** **3X2 = 06 Marks**
(Hydrophytes, Xerophytes, Epiphyte and Halophyte)
(Identification-1 Mark, Labelled diagram and comments-1Mark)

III. Comment on **E** (Ecological instruments) **02 Marks**
(Instruments studied in Practical. Idenfiaction-1Mark, Diagram and description 1Mark)

IV. Identify the slides/Chart **F** & **G** **2X2 = 04 Marks**

(One from adaptations, one from remote sensing of Satellite image or quadrat) (Identification 1Mark, Labelled diagram and comment 1Mark)

V. VIVA VOCE……. **02 Marks**

Field Visit……. **02 Marks**

Practical record……. **03 Marks**

(DSCC)

SCHEME OF BOTANY THEORY
EXAMINATION III SEMESTER: PAPER
BOT-A-4.1

MODEL QUESTION PAPER

Title of the Paper: ECOLOGY AND CONSERVATION BIOLOGY

Time: 2½Hours **Max Marks- 60**

Instructions: Draw neat labelled diagrams wherever necessary

IV. Define/Explain any Four of the following: **2X4=8 Marks**

1.
2.

3.

4.

5.

6.

V. Answer any Four of the following: **5X4=20 Marks**

7.
8.

9.

10.

11.
12.

VI. Answer any Four of the following: **8X4=32 Marks**

13.
14.

15.

16.

17.

18.

B.Sc. BOTANY – IV Semester

Open Elective Course (OEC- 4) (OEC for other students)

Paper: Floriculture

Code: OEC-4.3

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures / Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
OEC-4.3	OEC	Theory	03	03	42 hrs	2 hrs	40	60	100

Learning outcomes:

After completing this course the learner will be able to:

- Develop conceptual understanding of gardening from historical perspective
- Analyse various nursery management practices with routine garden operations.
- Distinguish among the various Ornamental Plants and their cultivation
- Evaluate garden designs of different countries
- Appraise the landscaping of public and commercial places for floriculture.
- Diagnoses the various diseases and uses of pests for ornamental plants

Unit I **14 Hrs.**

Introduction: History of gardening; Importance and scope of floriculture and landscape gardening. Nursery Management and Routine Garden Operations: Sexual and vegetative methods of propagation; Soil sterilization; Seed sowing; Pricking; Planting and transplanting; Shading; Stopping or pinching; Defoliation; Wintering; Mulching; Topiary; Role of plant growth regulators.

Unit II **14 Hrs.**

Ornamental Plants: Flowering annuals; Herbaceous perennials; Divine vines; Shade and ornamental trees; Ornamental bulbous and foliage plants; Cacti and succulents; Palms and Cycads; Ferns and fern allies; Cultivation of plants in pots; Indoor gardening; Bonsai. Principles of Garden Designs: English, Italian, French, Persian, Mughal and Japanese gardens; Features of a garden (Garden wall, Fencing, Steps, Hedge, Edging, Lawn, Flowerbeds, Shrubbery, Borders) Water-garden. Some Famous gardens of India.

Unit III **14 Hrs.**

Landscaping Places of Public Importance: Landscaping highways and Educational institutions. Commercial Floriculture: Factors affecting flower production; Production and packaging of cut flowers; Flower arrangements; Methods to prolong vase life; Cultivation of Important cut flowers (Carnation, Aster, Chrysanthemum, Dahlia, Gerbera, Gladiolus, Marigold, Rose, Lillium, and Orchids). Diseases and Pests of Ornamental Plants.

REFERENCES:

1. Randhawa, G.S. and Mukhopadhya, A. (1986).Floriculture in India. Allied Publishers.
2. Adams, C., M. Early and J. Brook (2011). Principles of Horticulture. 6th Edition, Routlledge Publishers London.
3. Chowdhari T.K.*et al* (2022) Text book on Floriculture Vol. 1 Narendra Publishing House New Delhi.
4. Anil K Singh and Anjana Sisodia (2017). Text Book of Floriculture and Landscaping. Nipa Genx Electronic resources and Solutions Pvt. Ltd.
5. Text Book of Floriculture & Landscaping by Anil K Singh, Anjana Sisodia (2020), New India Publishing Agency (Publisher)
6. Bharati Kashyap, Anil K. Thakur. (2020). Dinesh Gardening & Floriculture (Skill Enhancement Course) S Dinesh and Co Publishers.
7. Arvinder Singh and Nomita Laishram (2013). Objective Floriculture. Kalyani Publishers.
8. Subhash V. Ahire, Sharayu D. Sathe, Sanjay P. Ghanwat, Hemanthkumar A. Thakur, Bapu K. Avchar (2015). Horticulture And Floriculture, Success publishers, Pune.

Formative Assessment for Theory PAPER DSCC BOT-A-3.1 & A- 4.1	
Assessment	**40 Marks**
C1= Test I & II	(10+10) = 20 Marks
C2 = Assignment and continuous evaluation +Seminar	(10+10) = 20 Marks

Formative Assessment for Practical PAPER DSCCA-3.2 & A-4.2	
Assessment	**25 Marks**
C1= I A Test	15 Marks
C2 = Assignment+ Project Report	(5+5) = 10 Marks

Weightage of Marks DSCC B O T - A-3 & A-4				
Units	**2 marks**	**5 marks**	**8 marks**	**Total Marks.**
I	2X2=4	5X2=10	8X1=08	22
II	2X1=2	5X1=05	8X2=16	23
III	2X2=4	5X2=10	8X1=08	22
IV	2X1=2	5X1=05	8X2=16	23
S	12 Marks	30Marks	48 Marks	90 Marks

Blue print of the question paper

	No. of questions from each units		
Unit	**2 marks**	**5 marks**	**10 marks**
I	2	1 + 1	1
II	2	1 + 1	1
III	2	1	1 + ½
IV	2	1	1 + ½
Total No. of questions	**8**	**6**	**5**

Note: Equal importance and weightage is to be given to each units. **Section – C. Question No. 19**. a). and b). Which carries 5 marks each to be selected from the units III & IV.