

NATIONAL EDUCATION POLICY, 2020

B.Sc. Botany Syllabus

(Effective from the academic session, 2023 - 2024)



Department of Botany

North Lakhimpur College (Autonomous)

Affiliated to Dibrugarh University

Khelmati – 787031

Lakhimpur, Assam

Passed in Board of Studies on 29/04/2023

Course Categories: **DSC:** Discipline Specific Core, **DSE:** Discipline Specific Elective, **MDC:** Multidisciplinary Course, **IDC:** Interdisciplinary Course, **AECC:** Ability Enhancement Compulsory Course, **SEC:** Skill Enhancement Course, **VAC:** Value Addition Course

Course Transaction: **L:** Lecture, **T:** Theory, **Tu:** Tutorial, **P:** Practical

Evaluation Categories: **IA:** Internal Assessment, **ES:** End Semester Examination

SEM	COURSE	COURSE NAME	CREDI T	MARKS	ES	IA	L	T	P
I	DSC-I (T)	Plant Diversity	4	100	70	30	4	1	0
	DSC-I (P)	Based on DSC-I (Theory)	1	20	20	0	0	0	2
	DSE-I (T)	Diversity in Plant life	4	100	70	30	4	1	0
	DSE-I (P)	Based on DSE-I (Theory)	1	20	20	0	0	0	2
	IDC/ MDC-I (T)	Traditional Medicinal Practices	3	100	70	30	3	1	0
	AECC	Communicative English-I	2						
	SEC-I (T+P)	Mushroom Culture (Theory and Hands on Training)	3 (T+P= 1+2)	100	70	30	3	1	0
	VAC-I	(Dissertation/Thesis)	3	100	100	0	0	0	0
TOTAL			21						
II	DSC-II (T)	Cytology : Organelles and Biomolecules	4	100	70	30	4	1	0
	DSC-II (P)	Based on DSC-II (Theory)	1	20	20	0	0	0	2
	DSE-II (T)	Cell Biology	4	100	70	30	4	1	0
	DSE-II (P)	Based on DSE-II (Theory)	1	20	20	0	0	0	2
	IDC/ MDC-II	Intellectual Property Rights	3	100	70	30	3	1	0
	AECC	Language and Literature (MIL/Regional Language)	2						
	SEC-II (T+P)	Floriculture (Theory and Hands on Training)	3 (T+P= 1+2)	100	70	30	3	1	0
	VAC-II	(Dissertation/Thesis)	3	100	100	0	0	0	0
TOTAL			21						
Award of Under Graduate Certificate (after 1 year: 42 credits)									
<i>Students exiting the programme after securing 42 credits will be awarded UG Certificate in the relevant Discipline/Subject provided they secure 4 credits in work based vocational courses offered during summer term or Internship/Apprenticeship in addition to 6 credits from skill-based courses earned during first and second semester.</i>									

DEPARTMENT OF BOTANY
First Semester
BSc. (Hons.) Botany

DISCIPLINE SPECIFIC CORE COURSE – I: Plant Diversity

Learning Objectives

The Learning Objectives of this course are as follows:

- To make students aware about the diversity of plants and microbes present on the planet and how are they possibly related to each other in light of evolution.

Learning outcomes

The Learning Outcomes of this course are as follows:

By studying this course students will gain basic knowledge on

- The diversity of plants and microbes
- Their general characteristics
- Various groups of plants and their evolutionary relationships
- Basic principles and concepts of evolution that contribute to plant diversity

SYLLABUS OF DSC-I (Theory)

Course title: Plant Diversity

Code: MJ-T4-BOT-101

Marks = 56

- Unit 1: Bacteria** **5**
General characteristic features, cell structure, asexual reproduction, general idea on conjugation, transformation and transduction, brief introduction to Archaeobacteria.
- Unit 2: Viruses** **5**
General characteristic features, replication, RNA virus (structure of TMV), DNA virus (structure of T-phage), Lytic and Lysogenic life cycle (Lambda phage), brief account on Corona virus.
- Unit 3: Algae** **10**
General characteristic features, cell structure, range of thallus structure, methods of reproduction and evolutionary classification (only upto groups), economic importance. Morphology, Reproduction and life cycle of Oedogonium.
- Unit 4: Fungi** **10**
General characteristic features, reproduction, classification and economic importance. Myxomycetes and their similarities with fungi, plants and animals, Brief account of *Saccharomyces*, *Agaricus*. Introduction to lichens.
- Unit 5: Bryophytes** **5**
General characteristic features and reproduction, adaptation to land habit, classification.
- Unit 6: Pteridophytes** **8**
General characteristic features and reproduction, broad classification, ecological and economic importance. Brief account of *Lycopodium*, *Selaginella*, Apogamy and apospory, heterospory and seed habit.
- Unit 7: Gymnosperms** **8**
General characteristic features and reproduction, classification, ecological and economic importance. Brief account of *Cycas*, *Pinus*
- Unit 8: Angiosperms** **5**
General characteristic features and reproduction, Concept of natural, artificial and phylogenetic system of classification and binomial nomenclature.

SYLLABUS OF DSC-I (Practical)

Course title: Plant Diversity

Code: MJ-P1-BOT-101

Marks = 20

- 1.To study structure of TMV and Bacteriophage (electronmicrographs/models).
- 2.To study morphology of *Oedogonium*, *Chara*, *Ectocarpus* (Temporary preparation/specimens/slides).
- 3.To study *Rhizopus* and *Penicillium*(Temporary preparations), symptoms of rust of wheat, Late and Early blight of potato and Citrus canker.
- 4.To study *Riccia*, *Marchantia* and *Anthoceros* (morphology and reproductive structure)
- 5.To study *Lycopodium*, *Selaginella* and *Equisetum* (morphology and reproductive structure)
- 6.To study *Cycas* (megasporophyll and microsporophyll); *Pinus* (male and female cones,).
- 7.To study the types of inflorescences in angiosperms (through specimens).

Suggested Readings

- Campbell,N.A.,Reece,J.B.(2008.)Biology,8thedition,PearsonBenjaminCummings,SanFrancisco.
- Evert,RF.,Eichhorn,S.E.(2012).RavenBiologyofPlants,8thedition,NewYork,NY:W.H.Freemanand Company.
- Bhatnagar,S.P.,Moitra,A.(1996).Gymnosperms.NewDelhi,Delhi:NewAgeInternational(P)
- Tortora,G.J.,Funke,B.R.,Case.C.L.(2007).Microbiology.SanFrancisco,U.S.A:PearsonBenjamin Cummings.
- Vashishta,P.C.,Sinha,A.K.,Kumar,A.(2010).Pteridophyta.NewDelhi,Delhi:S.Chand &CoLtd.
- Singh,G.(2019)PlantSystematicsAnIntegratedApproach.4thedition.CRCPress,TaylorandFrancis Group

DEPARTMENT OF BOTANY

First Semester

BSc. (Hons.) Botany

DISCIPLINE SPECIFIC ELECTIVE COURSE – I: Diversity in Plant life

Learning Objectives

The Learning Objectives of this course are as follows:

- To make students aware about the diversity of plants and microbes present on the planet and how are they possibly related to each other in light of evolution.

Learning outcomes

The Learning Outcomes of this course are as follows:

By studying this course students will gain basic knowledge on

- The diversity of plants and microbes
- Their general characteristics
- Various groups of plants and their evolutionary relationships
- Basic principles and concepts of evolution that contribute to plant diversity

SYLLABUS OF DSE-I (Theory)

Course title: Diversity in Plant life

Code: MN-T4-BOT-101

Marks = 56

Unit 1: Bacteria	6
General characteristic, cell structure, asexual and sexual reproduction, conjugation, transformation and economic importance.	
Unit 2: Viruses	5
General character, replication, RNA virus (structure of TMV), DNA virus (structure of T-phage), Lytic and Lysogenic life cycle (Lambda phage) and economic importance.	
Unit 3: Algae	10
General characteristic features, cell structure, range of thallus structure, methods of reproduction and classification (only upto groups), economic importance.	
Unit 4: Fungi	15
Introduction, affinities with plants and animals, thallus organization, cell wall composition, reproduction and economic importance. Introduction to lichens and myxomycetes- their similarities with fungi, plants and animals,	
Unit 5: Archegoniates	15
Bryophytes	
General characteristic features and reproduction, adaptation to land habit, classification and economic importance.	
Pteridophytes	
General characteristic features and classification, ecological and economic importance. Apogamy and apospory, heterospory and seed habit.	
Gymnosperms	
General characteristic features and reproduction, classification, ecological and economic importance.	
Unit 6: Angiosperms	5
General characteristic features and reproduction, classification and binomial nomenclature.	

SYLLABUS OF DSE-I (Practical)

Course title: Diversity in plant life

Code: MN-P1-BOT-101

Marks = 20

- 1.To study structure of TMV and Bacteriophage (electronmicrographs/models).
- 2.To study morphology of *Volvox*, *Oedogonium* (Temporary preparation/specimens/slides).
- 3.To study *Rhizopus* and *Penicillium* (Temporary preparations), symptoms of rust of wheat
- 4.To study *Riccia*, *Marchantia* (morphology and reproductive structure)
- 5.To study *Lycopodium*, *Selaginella* (morphology and reproductive structure)
- 6.To study *Cycas* (megasporophyll and microsporophyll); *Pinus* (male and female cones,).

Suggested Readings

- Campbell,N.A.,Reece,J.B.(2008.)Biology,8thedition,PearsonBenjaminCummings,SanFrancisco.
- Evert,RF.,Eichhorn,S.E.(2012).RavenBiologyofPlants,8thedition,NewYork,NY:W.H.Freemanand Company.
- Bhatnagar,S.P.,Moitra,A.(1996).Gymnosperms.NewDelhi,Delhi:NewAgeInternational(P)
- Tortora,G.J.,Funke,B.R.,Case.C.L.(2007).Microbiology.SanFrancisco,U.S.A:PearsonBenjamin Cummings.
- Vashishta,P.C.,Sinha,A.K.,Kumar,A.(2010).Pteridophyta.NewDelhi,Delhi:S.Chand &CoLtd.
- Singh,G.(2019)PlantSystematicsAnIntegratedApproach.4thedition.CRCPress,TaylorandFrancis Group.
- Blackmore,S.,Crane,P.(2019)HowPlantsWork– Form,Diversity,Survival,PrincetonUniversityPress; Illustrated edition
- Ingrouille,M.,Eddie,B.(2006)Plants:EvolutionandDiversity.CambridgeUniversityPress.

MULTI DISIPLINARY COURSE – I: Traditional Medicinal Practices.

Learning Objectives

The Learning Objectives of this course are as follows:

- To make students aware about the ethnic importance of plants and their conservation of genetic resources.

Learning outcomes

The Learning Outcomes of this course are as follows:

By studying this course students will gain basic knowledge on

- Importance of ethnic knowledge
- Their general characteristics
- Various groups of plants and their uses
- Basic principles and concepts of local uses of plants and their contribution to the society.

SYLLABUS OF MDC/IDC-I (Theory)

Course title: Traditional Medicinal Practices

Code: MD-T3-BOT-101

Marks = 42

- Unit 1: Introduction** **5**
Concept, scope and objectives; the relevance of traditional medicine (ethnomedicine) in the present context.
- Unit 2: Methodology of Ethnomedicinal studies** **8**
a) Field work b) Herbarium c) Ancient Literature d) Archaeological findings e) temples and sacred places.
- Unit 3: Role of ethnobotany in modern Medicine** **10**
Medico-ethnobotanical sources in India; Significance of the following plants in ethnobotanical practices (along with their habitat and morphology) a) *Azadiractha indica* b) *Ocimum sanctum* c) *Vitex negundo*. d) *Gloriosa superba* e) *Tribulus terrestris* , Role of ethnobotany in modern medicine with special reference to *Rauwolfia serpentina*, *Trichopus zeylanicus*, *Artemisia*, *Withania*.
- Unit 4: Protection of Traditional Knowledge** **12**
Objective, Concept of Traditional Knowledge, Holders, Issues concerning Bio-Prospecting and Bio-Piracy, Alternative ways, Protect ability, need for a Sui-Generis regime, Traditional Knowledge on the International Arena, at WTO, at National level, Traditional Knowledge Digital Library.
- Unit 5: Ethnobotany and conservation** **7**
Ethnobotany as a tool to protect interests of ethnic groups. Sharing of wealth concept with few examples from India, Role of ethnic groups in conservation of plant genetic resources, endangered taxa and forest management (participatory forest management).

Suggested Readings

- 1) S.K. Jain, Manual of Ethnobotany, Scientific Publishers, Jodhpur, 1995.
- 2) S.K. Jain (ed.) Glimpses of Indian. Ethnobotany, Oxford and I B H, New Delhi – 1981
- 3) Lone et al., Palaeoethnobotany

SKILL ENHANCEMENT COURSE – I: Mushroom Cultivation

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Learning objectives:

1. Enable the students to identify edible and poisonous mushrooms.
2. Provide hands on training for the preparation of bed for mushroom cultivation and spawn production • Give the students exposure to the experiences of experts and functioning mushroom farms.
3. Help the students to learn a means of self employment and income generation.

Learning outcomes:

By successfully completing the course, students will be able to:

1. Identify edible types of mushroom.
2. Gain the knowledge of cultivation of different types of edible mushrooms and spawn production.
3. Manage the diseases and pests of mushrooms.
4. Learn a means of self-employment and income generation.

SYLLABUS OF SEC-I (Theory)

Course title: Mushroom Cultivation

Code: SE-T1-BOT-101

Marks = 28

Unit 1: Introduction to mushrooms

12

Mushrooms- History and Scope of mushroom cultivation, Edible and Poisonous Mushrooms, Vegetative characters, Nutritional and medicinal values of mushrooms, Therapeutic aspects- antitumor effect.

Unit 2: Common edible mushrooms

10

Button mushroom (*Agaricus bisporus*), Milky mushroom (*Calocybe indica*), Oyster mushroom (*Pleurotus sajor-caju*) and paddy straw mushroom (*Volvariella volvcea*).

Unit 3: Post harvest technology

6

Problems in cultivation - diseases, pests and nematodes, weed moulds and their management strategies. Preservation of mushrooms - freezing, dry freezing, drying, canning, quality assurance and entrepreneurship. Value added products of mushrooms.

Suggested readings

1. Marimuthu, T. et al. (1991). Oster Mushroom. Department of Plant Pathology. Tamil Nadu Agricultural University, Coimbatore.
2. Nita Bhal. (2000). Handbook on Mushrooms. 2nd ed. Vol. I and II. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
3. Pandey R.K, S. K Ghosh, 1996. A Hand Book on Mushroom Cultivation. Emkey Publications.
4. Pathak, V. N. and Yadav, N. (1998). Mushroom Production and Processing Technology. Agrobios, Jodhpur.
5. Tewari Pankaj Kapoor, S. C. (1988). Mushroom Cultivation. Mittal Publication, New Delhi.
6. Tripathi, D.P. (2005) Mushroom Cultivation, Oxford & IBH Publishing Co. PVT.LTD, New Delhi.

SYLLABUS OF SEC-I (Practical)

Course title: Mushroom Cultivation

Code: SE-P2-BOT-101

Marks = 40

1. Structure and construction of mushroom house, Sterilization and sanitation of mushroom house, sterilization of instruments and substrates.
2. Spawn production - culture media preparation, production of pure culture, mother spawn, and multiplication of spawn, Composting technology.
3. Mushroom bed preparation- Preparation of mother culture, media preparation, inoculation, incubation and spawn production.
4. Spawning, spawn running, harvesting and Cultivation of oyster mushroom using paddy straw/agricultural wastes.

**Second Semester
BSc. (Hons.) Botany**

DISCIPLINE SPECIFIC CORE COURSE – II: Cytology : Organelles and Biomolecules

Learning Objectives

The Learning Objectives of this course are as follows:

- Cell as a structural and functional unit of life.
- Types of biomolecules (proteins, carbohydrates, lipids and nucleic acids) and their roles in cell structure and function.
- Structures of different organelles and their role in fundamental metabolic processes of a cell.

Learning outcomes

The Learning Outcomes of this course are as follows:

By studying this course students will gain basic knowledge on

- The relationships between the properties of macromolecules, their cellular activities and biological functions.
- Physico-chemical composition of organelles and their functional organization.
- Basic principles and concepts of evolution that contribute to plant diversity.

SYLLABUS OF DSC-II (Theory)

Course title: Cytology: Organelles and Biomolecules

Code: MJ-T4-BOT-201

Marks = 56

Unit 1: Biomolecules	10
Types of chemical bonds and their biological significance. Structure and biological roles of carbohydrates, lipids, proteins and nucleic acids, ATP an energy currency molecule.	
Unit 2: The Cell	5
Cell as a unit of structure and function; Characteristics of prokaryotic and eukaryotic cells; Origin of eukaryotic cell (Endosymbiotic theory).	
Unit 3: Cell Wall and Plasma Membrane	6
Chemistry, structure and function of Plant Cell Wall, Plasma membrane Singer and Nicolson's fluid mosaic model of cell membrane.	
Unit 4: Cell Organelles: Structure and function of the following organelles	30
Nucleus: Structure and function (nuclear envelope, nuclear pore complex, nuclear lamina); types of chromatins; nucleolus.	
Chloroplast and Mitochondria: Structural organization; Function; Semi- autonomous nature of mitochondria and chloroplast.	
Endomembrane system: Endoplasmic Reticulum – Structure and function of RER and SER, Golgi Apparatus.	
Ribosome and Lysosomes: Structure and function.	
Cytoskeleton: Role and structure of microtubules, microfilaments, intermediary filament.	
Unit 5: Cell division	5
Cell cycle, mitosis and meiosis; regulation of cell cycle.	

SYLLABUS OF DSC-II (Practical)

Course title: Cytology: Organelles and Biomolecules

Code: MJ-P1-BOT-201

Marks = 20

1. Study of cell and its organelles with the help of electron micrographs and other digital resources.
2. Study of plant cell structure with the help of epidermal peel mount of *Allium*.
3. Microchemical tests for carbohydrates (reducing, non-reducing sugars and starch), lipids and proteins.
4. Separation of chlorophyll pigments by paper chromatography/ Thin Layer Chromatography.
5. Separation of amino acids by paper chromatography.
6. Demonstration of the phenomenon of plasmolysis and deplasmolysis.
7. Study of different stages of cell divisions.

Suggested readings:

1. Cooper, G.M., Hausman, R.E. (2019). The Cell: A Molecular Approach, 7th edition. Sinauer/OUP.
2. Iwasa, J, Marshall, W. (2020). Karp's Cell Biology, 9th edition, New Jersey, U.S.A.: John Wiley & Sons.
3. Majumdar, R., Sisodia, R. (2019). Laboratory Manual of Cell Biology, with reference to Plant Cells. New Delhi, Delhi: Prestige Publication.
4. Nelson, D.L., Cox, M.M. (2021). Lehninger Principles of Biochemistry, 8th edition. New York, NY: W.H. Freeman and Company.
5. Reven, F.H., Evert, R.F., Eichhorn, S.E. (1992). Biology of Plants. New York, NY: W.H. Freeman and Company.
6. Tymoczko, J.L., Berg, J.M., Stryer, L. (2012). Biochemistry: A short course, 2nd edition. New York, NY: W.H. Freeman and Company.

DISCIPLINE SPECIFIC ELECTIVE COURSE – II: Cell Biology

Learning Objectives

The Learning Objectives of this course are as follows:

- Cell as a structural and functional unit of life.
- Types of biomolecules (proteins, carbohydrates, lipids and nucleic acids) and their roles in cell structure and function.
- Structures of different organelles and their role in fundamental metabolic processes of a cell.

Learning outcomes

The Learning Outcomes of this course are as follows:

By studying this course students will gain basic knowledge on

- The relationships between the properties of macromolecules, their cellular activities and biological functions.
- Physico-chemical composition of organelles and their functional organization.
- Basic principles and concepts of evolution that contribute to plant diversity.

SYLLABUS OF DSE-II (Theory)

Course title: Cell Biology

Code: MN-T4-BOT-201

Marks = 56

Unit 1: Biomolecules	10
Structure and biological roles of carbohydrates, lipids, proteins and nucleic acids, ATP an energy currency molecule.	
Unit 2: The Cell	6
Cell as a unit of structure and function; Characteristics of prokaryotic and eukaryotic cells.	
Unit 3: Cell Wall and Plasma Membrane	10
Structure and function of Plant Cell Wall, Plasma membrane Singer and Nicolson's fluid mosaic model of cell membrane.	
Unit 4: Cell Organelles: Structure and function of the following organelles	25
Nucleus: Structure and function, types of chromatins; nucleolus.	
Chloroplast and Mitochondria: Structural organization; Function; Semi- autonomous nature of mitochondria and chloroplast.	
Endomembrane system: Endoplasmic Reticulum – Structure and function. Golgi Apparatus.	
Ribosome and Lysosomes: Structure and function.	
Unit 5: Cell division	5
Cell cycle, mitosis and meiosis.	

SYLLABUS OF DSE-II (Practical)

Course title: Cell Biology

Code: MN-P1-BOT-201

Marks = 20

1. Study of cell and its organelles with the help of electron micrographs and other digital resources.
2. Study of plant cell structure with the help of epidermal peel mount of *Allium*.
3. Microchemical tests for carbohydrates (reducing, non-reducing sugars and starch), lipids and proteins.
4. Demonstration of the phenomenon of plasmolysis and deplasmolysis.
5. Study of different stages of cell divisions (with the help of permanent slide)

Suggested readings:

1. Cooper, G.M., Hausman, R.E. (2019). The Cell: A Molecular Approach, 7th edition. Sinauer/OUP.
2. Iwasa, J, Marshall, W. (2020). Karp's Cell Biology, 9th edition, New Jersey, U.S.A.: John Wiley & Sons.
3. Majumdar, R., Sisodia, R. (2019). Laboratory Manual of Cell Biology, with reference to Plant Cells. New Delhi, Delhi: Prestige Publication.
4. Nelson, D.L., Cox, M.M. (2021). Lehninger Principles of Biochemistry, 8th edition. New York, NY: W.H. Freeman and Company.
5. Reven, F.H., Evert, R.F., Eichhorn, S.E. (1992). Biology of Plants. New York, NY: W.H. Freeman and Company.
6. Tymoczko, J.L., Berg, J.M., Stryer, L. (2012). Biochemistry: A short course, 2nd edition. New York, NY: W.H. Freeman and Company.

SYLLABUS OF MDC/IDC-II (Theory)

Course title: Intellectual Property Rights

Code: MD-T3-BOT-201

Marks = 42

- Unit 1: Introduction to Intellectual property rights (IPR)** **6**
Concept and kinds, IPR in India and world: Genesis and scope, IPR and WTO (TRIPS, WIPO).
- Unit 2: Protection of Plant Varieties** **8**
Plant Varieties Protection-Objectives, Justification, International Position, Plant varieties protection in India. Rights of farmers, Breeders and Researchers, National gene bank, Benefit sharing. Protection of Plant Varieties and Farmers' Rights Act, 2001.
- Unit 3: Geographical Indications** **10**
Objectives, Justification, International Position, Multilateral Treaties, National Level, Indian Position.
- Unit 4: Legal aspects** **12**
Patents- Objectives, Patent Act 1970 and its amendments, Procedure of obtaining patents, Working of patents, Copyrights- Introduction, Works protected under copyright law, Transfer of Copyright, Infringement, Trademarks- Objectives, Types, Rights, Protection of goodwill, Passing off, Defences, Domain name.
- Unit 5: Biotechnology and Intellectual Property Rights.** **6**
Patenting biotech Inventions: Objective, Applications, Concept of Novelty, Concept of inventive step, Microorganisms, Moral Issues in Patenting Biotechnological inventions.

Suggested Readings

1. N.S. Gopalakrishnan & T.G. Agitha, (2009) Principles of Intellectual Property Eastern Book Company, Lucknow.
2. Kerly's Law of Trade Marks and Trade Names (14th Edition) Thomson, Sweet & Maxweel.
3. Ajit Parulekar and Sarita D' Souza, (2006) Indian Patents Law – Legal & Business Implications; Macmillan India Ltd.

SEC-II : - Floriculture

Learning objectives:

1. Enable the students to know the scope of floriculture and landscape gardening.
2. Provide hands on training for the preparation of nursery bed and potting of flowering plants.
3. Help the students to learn a means of self employment and income generation.

Learning outcomes: By successfully completing the course, students will be able to:

1. Know proper Nursery Management
2. Gain the knowledge of cultivation of different types of ornamental and flowering plants
3. Learn a means of self-employment and income generation

SYLLABUS OF SEC-II (Theory)

Course title: Floriculture

Code: SE-T1-BOT-201

Marks = 28

- Unit 1: Introduction** **3**
History of gardening; Importance and scope of floriculture and landscape gardening.
- Unit 2: Nursery Management and Routine Garden Operations** **7**
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 3: Ornamental Plants** **6**
Flowering annuals; Herbaceous perennials; Divine vines; Shade and ornamental trees; Ornamental bulbous and foliage plants; Cacti and succulents; Palms and Cycads; Ferns and Selaginella; Indoor gardening; Bonsai, Common diseases and pests in ornamentals.
- Unit 4: Principles of Garden Designs** **6**
Garden designs of English, Italian, Mughal and Japanese; Features of a garden (Garden wall, Fencing, Steps, Hedge, Edging, Lawn, Flower beds, Shrubbery, Borders, Water garden. Some Famous gardens of India, Landscaping highways and Educational institutions.
- Unit 5: Commercial Floriculture** **6**
Factors affecting flower production- climatic factors, supply and demand; Production and packaging of cut flowers; Flower arrangements; Methods to prolong vase life

Suggested Readings

Randhawa, G.S. and Mukhopadhyay, A. 1986. Floriculture in India. Allied Publishers

SYLLABUS OF SEC-II (Practical)

Course title: Floriculture

Code: SE-P2-BOT-201

Marks = 40

Vegetative methods of propagation

Soil sterilization; Seed sowing; Pricking; Planting and transplanting

Cultivation of Important cut flowers (Carnation, Aster, Chrysanthemum, Dahlia, Gerbera, Gladiolous, Marigold,Rose, Lilium, Orchids),

Cultivation of plants in pots; Bonsai