FOUR YEAR UNDERGRADUATE PROGRAM (NEP–2020)

Program: Bachelor in Life Science (2024 -28)

DISCIPLINE – BOTANY

Session – 2024 -25

DSC -01 to 08		DSE -01 to 12	
Code	**Title**	**Code**	**Title**
BOSC -01T	*Elementary Botany*	BOSE -01T	*Natural resources and management*
BOSC -01P	*Lab. Course -01 (Elementary Botany)*	BOSE -01P	*Lab. Course -01 (Natural resources and management)*
BOSC -02T	*Microbes and Thallophyta*	BOSE -02T	*Microbiology and Phytopathology*
BOSC -02P	*Lab. Course –02 (Microbes and Thallophyta)*	BOSE -02P	*Lab. Course -02 (Microbiology and Phytopathology)*
BOSC -03T	*Archegoniate and Fossils*	B OSE -03T	*Phytopaleontology and Evolutionary Botany*
BOSC -03P	*Lab. Course-03 (Archegoniate and Fossils)*	BOSE -03P	*Lab. Course -03 (Phytopaleontology and Evolutionary Botany)*
BOSC -04T	*Angiosperms*	BOSE -04T	*Ethnobotany and Medicinal plants*
BOSC -04P	*Lab. Course – 04 (Angiosperms)*	BOSE -04P	*Lab. Course-04 (Ethnobotany & Medicinal plants)*
BOSC -05T	*Cytology and Genetics*	B OSE -05T	*Biosystematics and Biodiversity*
BOSC -05P	*Lab. Course -05 (Cytology and Genetics)*	BOSE -05P	*Lab. Course -05 (Biosystematics and Biodiversity)*
BOSC -06T	*Plant Physiology and Economic Botany*	BOSE -06T	*Plant breeding and Seed technology*
B OSC -06P	*Lab. Course -06 (Plant Physiology and Economic Botany)*	BOSE -06P	*Lab. Course -06 (Plant breeding and Seed technology)*
BOSC -07T	*Ecology and Phytogeography*	BOSE -07T	*Instrumentation and biochemical technology*
BOSC -07P	*Lab. Course –07 (Ecology and Phytogeography)*	BOSE -07P	*Lab. Course -07 (Instrumentation and biochemical technology)*
BOSC -08T	*Molecular biology and Biostatistics*	BOSE -08T	*Growth and Stress Physiology*
BOSC -08P	*Lab. Course-08 (Molecular biology and Biostatics)*	BOSE -08P	*Lab. Course -08 (Growth and Stress Physiology)*
		BOSE -09T	*Plant biotechnology and crop improvement*
		BOSE -09P	*Lab. Course -09 (Plant biotechnology and crop improvement)*
		BOSE -10T	*Applied Botany and Intellectual property right (IPR)*
		BOSE -10P	*Lab. Course -10 (Applied Botany and IPR)*
		BOSE -11T	*Biochemistry and Enzymology*
		BOSE -11P	*Lab. Course -11 (Biochemistry and Enzymology)*
		BOSE -12T	*Bioinformatics and Gene Technology*
		BOSE -12P	*Lab. Course-12 (Bioinformatics & Gene Technology)*
GE -01 & 02		**VAC**	
BOGE -01T	*Elementary Botany*	BOVAC-01	*Herbal Plant & Human Health*
BOGE -01P	*Lab. Course -01 (Elementary Botany)*	**SEC**	
BOGE -02T	*Microbes and Thallophyta*	BOSEC-01	*Gardening and Floriculture*
BOGE -02P	*Lab. Course –02 (Microbes and Thallophyta)*		

Program Outcomes (PO):

1. Demonstrate and apply the fundamental knowledge of the basic principles of major fields of biology
2. Apply knowledge to solve the issues related to plant sciences with the help of computer technology
3. Apply knowledge for conservation of endemic and endangered plant species

Program Specific Outcomes (PSO):

1. Collaborate effectively on team-oriented projects in the field of life sciences.
2. Communicate scientific information in a clear and concise manner both orally and in writing
3. Explain Biodiversity, climate change and plant pathology.
4. Apply Biotechnology, Ecology, Genetics and Plant breeding techniques in plant sciences
5. Apply knowledge of Medicinal and Economic botany in day to day life.
6. Apply the knowledge to develop the sustainable and eco-friendly technology.

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF BOTANY
COURSE CURRICULUM

PART- A: Introduction				
Program: Bachelor in Life Sciences *(Certificate / Diploma / Degree/Honors)*			**Semester - I**	Session: **2024-2025**
1	**Course Code**	**BOSC -01 T**		
2	**Course Title**	**Elementary Botany**		
3	**Course Type**	**Discipline Specific course (DSC)**		
4	**Pre-requisite** (if, any)	***As per program***		
5	**Course Learning. Outcomes (CLO)**	At the end of this course, the students will be able to ➢ Understand the Basics of Botany and its branches. ➢ Get acquainted with complex interrelationship between organisms and environment. ➢ Develop a comprehensive understanding of the identification, cultivation, and processing of medicinal plants, and their chemical constituents. ➢ Utilize plants resources for livelihood.		
6	**Credit Value**	**3 Credits**	***Credit = 15 Hours - learning & Observation***	
7	**Total Marks**	**Max. Marks: 100**	**Min Passing Marks: 40**	

PART -B: Content of the Course

Total No. of Teaching–learning Periods (01 Hr. per period) - 45 Periods (45 Hours)

Unit	Topics (Course contents)	No. of Period
I	**Basics of Plant Science**: Differences and resemblances between; living and nonliving plants and animals, plant and animal cell. Concept of prokaryotes and eukaryotes.Importan features of thallophyta, Bryophyta, Pteridophyta, Gymnosperm and Angiosperm.Structure an function of a typical flowering plant.	12
II	**Branches of botany:** General idea, features, and significance; Anatomy, Cytology, Economic Botany, Ethnobotany, Forestry, Genetics, Histology, Microbiology, Paleobotany, Phytochemistry, Phytopathology , Plant biotechnology, Plant breeding, Plant ecology, Plant morphology, Plant physiology, Plant Taxonomy, etc,	11
III	**Plants for human welfare:**Plant Resources for Rural livelihood – Mahua, Tendu patta, Bamboo and Firewood.Ethnobotany in India: Methods to study Ethnobotany, Applications of Ethnobotany, ethnomedicinal plants and ethnoecology. Application of plant products for certain diseases- Cough and cold, Jaundice, Infertility, Diabetes, Blood pressure and Skin diseases.	11
IV	**Ancient Indian Botany:**Indigenous Medicinal Sciences;Definition and Scope-Ayurveda: History, origin, panchamahabhutas, saptadhatu and tridosha concepts, Rasayana, plants used in ayurvedic treatments, Siddha: Origin of Siddha medicinal systems, Basis of Siddha system, plants used in Siddha medicine. Unani: History, concept. Charaksamhita. Ancient and modern Botanists and their contributions.-Charak, Jagdish Chandra Bose, B.P.Pal, Desikachary,K.C. Mehta M.S. Swaminathan etc.	11
Keywords	***Prokaryotes, Ethnobotany, Taxonomy, Ayurveda***	

Signature of Convener & Members (CBoS) :

PART–C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended –

1. College Botany Ganguli Kar and dutta , HIMALAYA Publishers
2. "Handbook of Medicinal Plants" by L.D. Kapoor
3. "Indian Medicinal Plants: An Illustrated Dictionary" by C.P. Khare
4. "Medicinal Plants in India: Conservation and Sustainable Utilization in the Emerging Global Scenario" edited by V.K. Gupta
5. "A Compendium of Medicinal Plants in India: An Introduction to Ayurveda" by S.L. Kochhar
6. A handbook of forest utilization by T. Mehta
7. Plants and human welfare by O.P.Sharma

Reference Books Recommended –

1. Charak Samhita
2. Medicinal Plants of India" by C.P. Khare

Online Resources–

- **e-books and e-learning portals**
- **www.swayam.ac.in**
- **www.ignou.ac.in**
- **www.egyankosh.ac.in**
- **www.iitm.ac.in**
- **www.eskillindia.org**
- **www.eshiksha.mp.gov.in**
- **www.vlab.co.in**
- **www.internshala.com**
- **www.ndl.iitkgp.ac.in**

Online Resources–

e-Resources / e-books and e-learning portals

- https://extension.oregonstate.edu/collection/botany-basics
- https://www.pbs.org/video/botany-basics-iuu2bl/
- https://efaidnbmnnnibpcajpcglclefindmkaj/https://www2.ca.uky.edu/agcomm/pubs/ho/ho96/ho96.pdf
- https://www.botanytoday.com/branches-of-botany/
- https://efaidnbmnnnibpcajpcglclefindmkaj/https://www.unanijournal.com/articles/94/3-1-11-206.pdf
- https://efaidnbmnnnibpcajpcglclefindmkaj/https://wgbis.ces.iisc.ac.in/biodiversity/sahyadri/documents/botany_history.pdf
- https://vedpuran.files.wordpress.com/2016/07/charaksamhitaatridevajigupt-vol-1.pdf
- https://egyankosh.ac.in/handle/123456789/89429

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks:	**100 Marks**
Continuous Internal Assessment (CIA):	**30 Marks**
End Semester Exam (ESE):	**70 Marks**

Continuous Internal Assessment (CIA): 30 **(By Course Teacher)**	Internal Test / Quiz-(2): **20 +20** Assignment / Seminar - **10** Total Marks - **30**	Better marks out of the two Test / Quiz **+** obtained marks in Assignment shall be considered against **30** Marks
End Semester Exam (ESE): 70	**Two section – A & B** Section A: **Q1**. Objective – **10 x1= 10** Mark; **Q2**. Short answer type- **5x4 =20 Marks** Section B: Descriptive answer type qts.,**1out of 2** from each unit-**4x10=40 Marks**	

Name and Signature of Convener & Members of CBoS:

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FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF BOTANY
COURSE CURRICULUM

PART- A: Introduction				
Program: Bachelor in Life Sciences *(Certificate / Diploma / Degree/ Honors)*		**Semester - I**	Session: **2024-2025**	
1	**Course Code**	**BOSC -01**		
2	**Course Title**	**Lab. Course -01 (Elementary Botany)**		
3	**Course Type**	**Laboratory course**		
4	**Pre-requisite** (if, any)	***As per program***		
5	**Course Learning. Outcomes (CLO)**	At the end of this course, the students will be able to ➢ Understand structure of plant cell, prokaryotic cell and eukaryotic cell. ➢ Identify pteridophytes of college campus. ➢ Learn about the different types of plant tissues. ➢ Learn about Ayurvedic system of medicine.		
6	**Credit Value**	**1 Credits**	***Credit =30 Hours Laboratory or Field learning/Training***	
7	**Total Marks**	**Max. Marks: 50**	**Min Passing Marks: 20**	

PART -B: Content of the Course

Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)

Module	Topics (Course contents)	No. of Period
Lab./Field Training/ Experiment Contents of Course	**1.** Microscopic study of plant cell. **2.** Microscopic study of prokaryotic (Bacteria) and eukaryotic cell (algae and fungi). **3.** Study of thallus structure of *Riccia* and *Marchantia*. **4.** Identification of different plants growing in college campus. **5.** Study of a typical flowering plant and it's parts. **6.** Study of internal structure of root and stem. **7.** Study of parenchyma, collenchyma and sclerenchyma. **8.** Study of medicinal plants of college campus. **9.** Study of plants used to cure cough and cold, jaundice and skin diseases. **10.** Visit to any local ayurvedic hospital / practitioner to understand Ayurveda.	**30**
Keywords	***Prokaryotic, Parenchyma, Jaundice, Ayurveda.***	

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PART–C: Learning Resources

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- **www.eshiksha.mp.gov.in**
- **www.vlab.co.in**
- **www.internshala.com**
- **www.ndl.iitkgp.ac.in**

Online Resources–

- **e-Resources / e-books and e-learning portals**
- **https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5871155/**
- **https://cms.botany.org/home/careers-jobs/careers-in-botany/areas-of-specialization-in-botany.html**

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 50 Marks
Continuous Internal Assessment (CIA): 15 Marks
End Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): 15 **(By Course Teacher)**	Internal Test / Quiz-(2): **10 & 10** Assignment/Seminar +Attendance - **05** Total Marks - **15**	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against **15** Marks
End Semester Exam (ESE): 35	**Laboratory / Field Skill Performance: On spot Assessment** A. **Performed the Task based on lab. work - 20 Marks** B. **Spotting based on tools & technology** (written) **– 10 Marks** C. **Viva-voce (based on principle/technology) - 05 Marks**	**Managed by Course teacher as per lab. status**

Name and Signature of Convener & Members of CBoS: