

DEPARTMENT OF BOTANY
COURSE CURRICULUM & MARKING SCHEME

B.Sc. I, II, III, IV Semester
BOTANY

(Based on Choice Based Credit System)

SESSION : 2025-26



ESTD : 1958

GOVT. V.Y.T. PG AUTONOMOUS COLLEGE,
DURG, 491001 (C.G.)

(Former Name – Govt. Arts & Science College, Durg)

NAAC Accredited Grade A⁺, College with CPE - Phase III (UGC), STAR COLLEGE (DBT)

Phone : 0788-2212030

Website - www.govtsciencecollegedurg.ac.in, Email – autonomousdurg2013@gmail.com

GOVT. V.Y.T. PG. AUTONOMOUS COLLEGE, DURG (C.G.)

FOUR YEAR UNDERGRADUATE PROGRAM

DEPARTMENT OF BOTANY

SYLLABUS SCHMEME FOR UG – 2025 – 26

SEMESTER – I - VI

Course	DSC		DSE	
Semester	Code	Title	Code	Title
I	BOSC – 01	Elementary Botany		
II	BOSC – 02	Microbes and Thallophyta		
III	BOSC – 03	Archegoniate and Fossils	BOSE – 01	Natural Resources and Management
IV	BOSC – 04	Angiosperms	BOSE – 02	Microbiology and Phytopathology
	GE 01 & 02		SEC	
I	BOGE - 01	Elementary Botany	BOSEC-01	Gardening and Floriculture
II	BOGE - 02	Microbes and Thallophyta		
IV			BOSEC-02	Flower Decoration

FOUR YEAR UNDERGRADUATE PROGRAM

SEMESTER I & II

SESSION 2025-26

SUBJECT - BOTANY

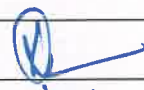
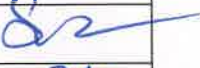
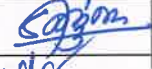
DSC

GOVT. V.Y.T.PG AUTONOMOUS COLLEGE DURG
FOUR YEAR UNDERGRADUATE PROGRAM
DEPARTMENT OF BOTANY
COURSE CURRICULUM 2025-26

Part A: Introduction			
Program: Bachelor in Life Sciences (Certificate/Diploma/Degree/Honors)		Semester - I	Session: 2025-26
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 Outcome (CLO)	At the end of this course, students will be able to • Understand the basics of botany and its branches. • Get acquainted with the complex interrelationships between organisms and the environment. • Develop a comprehensive understanding of the identification, cultivation, and processing of medicinal plants and their chemical constituents. • Utilize plant resources for livelihood.	
6	Credit Value	3 Credits	1 Credit =15 Hours – Learning and Observation
7	Total Marks	Maximum Marks: 100	Minimum Passing Marks: 40
Part B: Content of the Course			
Total No. of Teaching/ Learning Periods (1 Hr. per Period) = 45 Periods (45 Hours)			
Unit	Topics (Course Contents)		No. of Periods
I	Basics of Plant Science: Differences and resemblances between living and nonliving plants and animals, plant and animal cells. Concept of prokaryotes and eukaryotes. Important features of thallophyta, bryophyta, pteridophyta, gymnosperm, and angiosperm. Structure and 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, jawbone, 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	

Name & Signature of Members of Board of Studies

S. No.	Category	Name of Nominated Members	Signature
1.	Chairperson	Dr. G. S. Thakur	
2.	Members	Dr. Vijay Laxmi Naidu	
		Dr. Satish Kumar Sen	
		Dr. Shriram Kunjam	
		Mr. Motiram Sahu	
		Dr. Rajeshwari Prabha Lahare	
3.	Subject specialist	1. Prof. P.C. Panda Retd. Professor Borsi Durg C.G.)	
		2. Dr. N.B. Singh (Govt. N.PG. Science College Raipur C.G.)	
4.	VC Nominated member	Dr. Aruna Shrivastava (Govt. D.B. Girls PG College Raipur C.G.)	
5.	Corporate/ Industrial area Representative	Shri Manish Jain (Apollo College, Durg C.G.)	
6.	Ex Meritorious Student PG	Devika Janghel	
7.	Subject expert from other Department	Dr. Divya Minz (Department of Zoology, Govt. V.Y.T. PG. Autonomous College Durg C.G.)	

Part C - Learning Resources

Text Books, Reference Books, Other Resources

Recommended Text Books

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

Recommended Reference Books

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/charaksamhitaatrivedvajigupt-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 + Attendance – 10 Total Marks – 30	Better marks out of two test / Quiz + Obtains Marks in assignment shall considered against 30 Marks
End Semester Exam (ESE): 70	Two Section – A & B Section A: Q1. Objectives -10x1 = 10 Marks; Q2. Short Answer Type- 5x4 = 20Marks Section B: Descriptive answer type question 1 out of 2 from each unit- 4x10 = 40 Marks	



GOVT. V.Y.T.PG AUTONOMOUS COLLEGE DURG
FOUR YEAR UNDERGRADUATE PROGRAM
DEPARTMENT OF BOTANY
COURSE CURRICULUM 2025-26
Lab Course

Part A: Introduction			
Program: Bachelor in Life Sciences (Certificate/Diploma/Degree/Honors)		Semester - I	Session: 2025-26
1	Course Code	BOSC – 01 P	
2	Course Title	Lab. Course 01 (Elementary Botany)	
3	Course Type	Laboratory Course	
	Pre-requisite (if, any)	As per program	
4	Course Learning Outcome (CLO)	At the end of this course, students will be able to • Understand the structure of plant cells, prokaryotic cells, and eukaryotic cells. • Identify pteridophytes on college campuses. • Learn about the different types of plant tissues. • Learn about the Ayurvedic system of medicine.	
5	Credit Value	1Credit	1 credit =30 Hours – Laboratory or field learning/Training
6	Total Marks	Maximum Marks: 50	Minimum Passing Marks: 20
Part B: Content of the Course			
Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)			
S.No.	List of Experiments		
Lab./Field Training/Experiment Contents of course	1. Microscopic study of plant cells. 2. Microscopic study of prokaryotic (bacteria) and eukaryotic cells (algae and fungi). 3. Study of thallus structure of Riccia and Marchantia. 4. Identification of different plants growing on college campus. 5. Study of a typical flowering plant and its parts. 6. Study of internal structure of root and stem. 7. Study of parenchyma, collenchyma, and sclerenchyma. 8. Study of medicinal plants on college campus. 9. Study of plants used to cure cough, cold, jaundice, and skin diseases. 10. Visit any local Ayurvedic hospital/practitioner to understand Ayurveda.		30
Keywords	Prokaryotic, Parenchyma, Jaundice, Ayurveda		



Part C: Learning Resources

Text Books, Reference Books, Other Resources

Recommended Text Books -

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

Recommended Reference Books -

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

Online Resources -

e-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://www.ncbi.nlm.nih.gov/pmc/articles/PMC5871155/>
- <https://cms.botany.org/home/careers-jobs/careers-in-botany/areas-of-specialization-in-botany.html>

Online Resources: (e- Resources/ e- Books/ e- Learning Portals)

PART D: ASSESSMENT AND EVALUATION

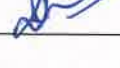
Suggested Continuous Evaluation Methods:

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



Continuous Internal Assessment (CIA): 15 Marks (By Course Teacher)	Internal test/Quiz-(2): 10 Assignment/Seminar + Attendance – 05 Total Marks- 15	Better marks out of two Test / Quiz + obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE): 30 Marks	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 & Signature of Members of Board of Studies

S. No.	Category	Name of Nominated Members	Signature
1.	Chairperson	Dr. G. S. Thakur	
2.	Members	Dr. Vijay Laxmi Naidu	
		Dr. Satish Kumar Sen	
		Dr. Shriram Kunjam	
		Mr. Motiram Sahu	
		Dr. Rajeshwari Prabha Lahare	
3.	Subject specialist	1. Prof. P.C. Panda Retd. Professor Borsi Durg C.G.)	
		2. Dr. N.B. Singh (Govt. N.PG. Science College Raipur C.G.)	
4.	VC Nominated member	Dr. Aruna Shrivastava (Govt. D.B. Girls PG College Raipur C.G.)	
5.	Corporate/ Industrial area Representative	Shri Manish Jain (Apollo College, Durg C.G.)	
6.	Ex Meritorious Student PG	Devika Janghel	
7.	Subject expert from other Department	Dr. Divya Minz (Department of Zoology, Govt. V.Y.T. PG. Autonomous College Durg C.G.)	

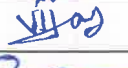


GOVT. V.Y.T.PG AUTONOMOUS COLLEGE DURG
FOUR YEAR UNDERGRADUATE PROGRAM
DEPARTMENT OF BOTANY
COURSE CURRICULUM 2025-26

Part A: Introduction			
Program: Bachelor in Life Sciences <i>(Certificate/Diploma/Degree/Honors)</i>		Semester – II	Session: 2025-26
1	Course Code	BOSC - 02 T	
2	Course Title	Microbes and Thallophyta	
3	Course Type	Discipline Specific Course (DSC)	
4	Pre-requisite (if, any)	<i>As per program</i>	
4	Course Learning Outcome (CLO)	At the end of this course, students will be able to • Understand about microbes and their importance. • Identify edible mushrooms and learn cultivation techniques. • Learn about biofertilizers and their uses. • Understand life cycles of different algae and fungi.	
5	Credit Value	3 Credits	1 Credit =15 Hours – Learning and Observation
6	Total Marks	Maximum Marks: 100	Minimum Passing Marks: 40
Part B: Content of the Course			
Total No. of Teaching/ Learning Periods (1 Hr. per Period) = 45 Periods (45 Hours)			
Unit	Topics (Course Contents)		No. of Periods
I	Viruses: General characteristics, nature, structure, and nomenclature; Bacteriophages and TMV; Lytic and lysogenic cycles; Transmission and replication of viruses; Symptoms of viral diseases on plants; Important plant diseases; Viroids and prions; Actinomycetes: General characteristics, structure, reproduction, and economic importance; Mycoplasma and Phytobacteria: General characteristics, structure, reproduction, and their economic uses.		12
II	Bacteria: History, general character, classification, and morphology; Gram-positive and Gram-negative bacteria; Structure of bacterial shape, flagella size, and ultrastructure of bacterial cells; Bacterial growth curve, factors affecting growth of microbes; Sporulation, reproduction, recombination in bacteria; Transformation, conjugation, and transduction; and Economic importance. Cyanobacteria: General characteristics, morphology, heterocysts, cell structure of cyanobacteria, reproduction, and economic importance of bacteria.		11

III	Phycology: General characteristic features of algae. Algae in diverse habitats. Salient features, occurrence, classification, and range of thallus organization. Prominent pigments found in algae. Reproduction classification, general character, and life cycle of Volvox, Oedogonium, Chara, Vaucheria, Ectocarpus, and Polysiphonia. Economic importance of algae - Role of algae in soil fertility, algae as biofertilizer, blue green algae, and nitrogen fixation. Symbiosis; algal products - Agar, biofuel	11
IV	Mycology, Mushroom Cultivation, Lichenology & Mycorrhiza: General characteristic features of fungi, economic importance and classification of fungi, nutrition, heterothallism, physiological specialization, heterokaryosis & parasexuality in fungi. Fungi as biocontrol agents. Classification, general character and life cycle of Mucor, Phytophthora penicillium, Peziza, Ustilago, Puccinia, Agaricus; Colletotrichum, Alternaria. Edible mushrooms—button and oyster mushrooms and their cultivation. General account of lichens. General account of Mycorrhiza.	11
Keywords	Mycoplasma, transduction, biofertilizer, parasexuality.	

Name & Signature of Members of Board of Studies

S. No.	Category	Name of Nominated Members	Signature
8.	Chairperson	Dr. G. S. Thakur	
9.	Members	Dr. Vijay Laxmi Naidu	
		Dr. Satish Kumar Sen	
		Dr. Shriram Kunjam	
		Mr. Motiram Sahu	
		Dr. Rajeshwari Prabha Lahare	
10.	Subject specialist	1. Prof. P.C. Panda Retd. Professor Borsi Durg C.G.)	
		2. Dr. N.B. Singh (Govt. N.PG. Science College Raipur C.G.)	
11.	VC Nominated member	Dr. Aruna Shrivastava (Govt. D.B. Girls PG College Raipur C.G.)	
12.	Corporate/ Industrial area Representative	Shri Manish Jain (Apollo College, Durg C.G.)	
13.	Ex Meritorious Student PG	Devika Janghel	
14.	Subject expert from other Department	Dr. Divya Minz (Department of Zoology, Govt. V.Y.T. PG. Autonomous College Durg C.G.)	

PART C - LEARNING RESOURCES

Text Books, Reference Books, Other Resources

Text Books Recommended –

1. Kumar, H.D. (1999). Introductory Phycology. Affiliated East-West. Press Pvt. Ltd. Delhi. 2nd edition.
2. Annie Ragland, 2012. Algae and Bryophytes, Saras Publication, Kanyakumari, India.
3. Aneja, K. R. 1993. Experiments in Microbiology, Pathology and Tissue Culture, Vishwa Prakashan, New Delhi.
4. Chopra, G. L. 1984. A text book of Algae, Rastogi publications, Meerut, India.
5. . Dubey, R. C. and Maheshwari. D.K. 2012. Practical Microbiology, S. Chand & Company, Pvt. Ltd., New Delhi.
6. Tortora, G.J., Funke, B.R., Case, C.L. (2010). Microbiology: An Introduction, Pearson Benjamin Cummings. U.S.A. 10th edition.
7. Sethi, I.K. and Walia, S.K. (2011). Text book of Fungi & Their Allies, MacMillan Publishers Pvt. Ltd., Delhi.
8. Aggarwal, S. K. 2009. Foundation Course in Biology, A one books Pvt. Ltd., New Delhi.
9. Basu, A. N. 1993. Essentials of Plant Viruses, Vectors and Plant diseases, New Age International, New Delhi.
10. Fritsch, R. E. 1977. Structure and Reproduction of Algae, Cambridge University Press, London.
11. Sharma, P.D. (2011). Plant Pathology. Meerut, U.P.: Rastogi Publication.
12. Pandey B.P. 2001. College Botany Volume 1, S Chand & Company Pvt.Ltd, New Delhi.

Reference books:

1. Webster, J., Weber, R. (2007). Introduction to Fungi, 3rd edition. Cambridge, U.K.: Cambridge University Press.
2. Pelzar, 1963. Microbiology, Tata McGraw Hill, New Delhi
3. Rangaswamy, G. 2009, Disease of Crop Plants in India, Prientice Hall of India, New Delhi.
4. Microbiology Fundamental and Applications (hindi) (pb) 9. ISBN: 9788188826230 Edition: 03 Year:
5. Plant pathology by R.S. Mehrotra, Tata McGraw-Hill Publication
6. 2016 Author: Dr. Purohit SS, Dr. Deo Publisher: Student Edition Language: Hindi Modern Microbiology (hindi) (hb) ISBN: 9788177543599 Edition: 1 Year: 2018 Author: Dr. Purohit SS,
7. Dr. Singh T Publisher: Agrobios (India)

Online Resources-

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

e-Resources / 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-

- <https://www.classcentral.com/tag/microbiology>
- <https://www.edx.org/learn/microbiology>
- <https://www.mooc-list.com/tags/microbiology>
- <https://www.udemy.com/topic/microbiology/>
- <https://ucmp.berkeley.edu/bacteria/bacteria.html>
- <https://www.livescience.com/53272-what-is-a-virus.html>
- <https://gclambathach.in/lms/Economic%20importance%20of%20Algae.pdf>
- <https://www.slideshare.net/sardar1109/algae-notes-1>
- <https://www.onlinebiologynotes.com/algae-general-characteristics-classification/>
- <https://www.sciencedirect.com/topics/immunology-and-microbiology/fungus>
- <https://ucmp.berkeley.edu/fungi/fungi.html>
- <https://agrimoon.com/wp-content/uploads/Mashroom-culture.pdf>
- <http://ecoursesonline.iasri.res.in/mod/page/view.php?id=11293>
- [http://www.jnkvv.org/PDF/11042020102651plant pathology.pdf](http://www.jnkvv.org/PDF/11042020102651plant%20pathology.pdf)
- <https://www.apsnet.org/edcenter/disimpactmngmnt/topc/EpidemiologyTemporal/Pages/ManagementStrategien.aspxBro>
- <https://www.agrilcareer.com/6-easy-steps-for-mushroom-cultivation/>

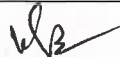
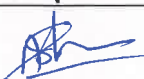
PART D: ASSESSMENT AND EVALUATION**Suggested Continuous Evaluation Methods:****Maximum Marks: 100 Marks****Continuous Internal Assessment (CIA): 30 Marks****End Semester Exam (ESE): 70 Marks**

Continuous Internal Assessment (CIA): 15 By Course Teacher	Internal Test/Quiz (2):	20 & 20	Better marks out of two test / Quiz + Obtains Marks in assignment shall considered against 30 Marks
	Assignment/Seminar + Attendance	– 10	
	Total Marks	– 30	

End Semester Exam (ESE): 35	Two Section A & B Section A: Q1. Objectives -10x1=10 Marks Q2. Short answer Type- 5x4=20Marks Section B: Descriptive answer type qts. 1 out of 2 from each unit-4x10=40 Marks
------------------------------------	--



Name & Signature of Members of Board of Studies

S. No.	Category	Name of Nominated Members	Signature
1.	Chairperson	Dr. G. S. Thakur	
2.	Members	Dr. Vijay Laxmi Naidu	
		Dr. Satish Kumar Sen	
		Dr. Shriram Kunjam	
		Mr. Motiram Sahu	
		Dr. Rajeshwari Prabha Lahare	
3.	Subject specialist	1. Prof. P.C. Panda Retd. Professor Borsi Durg C.G.)	
		2. Dr. N.B. Singh (Govt. N.PG. Science College Raipur C.G.)	
4.	VC Nominated member	Dr. Aruna Shrivastava (Govt. D.B. Girls PG College Raipur C.G.)	
5.	Corporate/Industrial area Representative	Shri Manish Jain (Apollo College, Durg C.G.)	
6.	Ex Meritorious Student PG	Devika Janghel	
7.	Subject expert from other Department	Dr. Divya Minz (Department of Zoology, Govt. V.Y.T. PG. Autonomous College Durg C.G.)	

GOVT. V.Y.T.PG AUTONOMOUS COLLEGE DURG
FOUR YEAR UNDERGRADUATE PROGRAM
DEPARTMENT OF BOTANY
COURSE CURRICULUM 2025-26
Lab Course

PART A: INTRODUCTION				
Program: Bachelor in Life Sciences (Certificate/Diploma/Degree/Honors)			Semester - II	Session: 2025-26
1	Course Code	BOSC - 02 P		
2	Course Title	Lab Course (Microbes and Thallophyta)		
3	Course Type	Laboratory Course		
4	Pre-requisite (if, any)	As per program		
5	Course Learning Outcome (CLO)	At the end of this course, students will be able to • Understand viruses, bacteria, phycology, mycology, and plant pathology • Learn microbial techniques that will be beneficial for agriculture and industry. • Learn life cycles of selected genera of different groups • Understand the etiology of plant diseases • Apply their knowledge in crop fields to eradicate or avoid diseases		
6	Credit Value	1Credit	1 credit =30 Hours Laboratory or Field learning/Training	
7	Total Marks	Maximum Marks: 50		Minimum Passing Marks: 20
Part B: Content of the Course				
Total No. of Teaching/ Learning Periods (1 Hr. per Period) = 45 Periods (45 Hours)				
S. No.	List of Experiments			
Lab./Field Training/Experiment Content of Course	1. Collection Of Viral/Bacterial/Fungal Infected Plants 2. Study Of Plant Disease Symptoms Caused By Viral/Bacterial / Fungal / Mycoplasma 3. Bacterial Identification: Isolation of Bacteria Staining Techniques: Gram Staining, Staining 4. Study/Slide Preparation Of Available Cyanobacteria 5. Phycology: Study/Slide Preparation And Staining Of Algae - Volvox, Oedogonium, And Chara; Vaucheria; Ectocarpus; Polysiphonia 6. Mycology: Study/Slide Preparation And Staining Of Fungi - Mucor, Phytophthora, Penicillium, Peziza, Ustilago, Puccinia; Agaricus, Colletotrichum, Alternaria Study Of Button And Oyster Mushrooms Lichens: Crustose, Foliose, and fruticose specimens Study of VAM fungi			30
Keywords	Infected Plants, VAM, Algae, Fungi			



Part C: Learning Resources

Text Books, Reference Books, Other Resources

Recommended Text Books

1. Practical Botany (Part I) ISBN #: 81-301-0008-8, Sunil D. Purohit, Gotam K. Kukda & Anamika Singhvi, 2013 Edition, Apex Publishing House, Durga Nursery Road, Udaipur, Rajasthan (bilingual).
2. Pandey S.K. (2012). Quick Concept of Botany. Publisher LAP LAMBERT Academic Publishing GmbH & Co. KG, Germany (ISBN: 978-3-8484-3104-5).
3. Dubey, R. C., and Maheshwari, D.K. 2012. Practical Microbiology. S. Chand & Company, Pvt. Ltd., New Delhi
4. Pandey. B.P. 2014 Modern Practical Botany, (Vol. I) S. Chand and Company Pvt. Ltd., New Delhi.

Online Resources

e-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

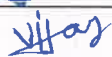
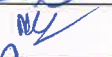
e-Resources / e-books and e-learning portals

1. <https://community.plantae.org/tags/moocfuturelearn.com/courses/teaching-biology-inspiring-students-with-plants-in-science>
2. <https://microbiologysociety.org/publication/education-outreach-resources/basic-practical-microbiology-a-manual.html>
3. <https://microbiologyonline.org/file/7926d7789d8a2f7b2075109f68c3175e.pdf>
4. <http://allaboutalgae.com/benefits/>
5. <https://repository.cimmyt.org/xmlui/bitstream/handle/10883/3219/64331.pdf>
6. <https://www.mooc-list.com/tags/microbiology>
7. <http://www.agrifs.ir/sites/default/files/A%20text%20book%20of%20practical%20botany%20>
8. <https://171339239%5D%20%281984%29.pdf>



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 Marks (By Course Teacher)	Internal test/Quiz-(2): 10 & 10 Assignment/Seminar +Attendance – 05 Total Marks- 15	Better marks out of two Test/ Quiz + obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE): 30 Marks	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 & Signature of Members of Board of Studies

S. No.	Category	Name of Nominated Members	Signature
1.	Chairperson	Dr. G. S. Thakur	
2.	Members	Dr. Vijay Laxmi Naidu	
		Dr. Satish Kumar Sen	
		Dr. Shriram Kunjam	
		Mr. Motiram Sahu	
		Dr. Rajeshwari Prabha Lahare	
3.	Subject specialist	1. Prof. P.C. Panda Retd. Professor Borsi Durg C.G.)	
		2. Dr. N.B. Singh (Govt. N.PG. Science College Raipur C.G.)	
4.	VC Nominated member	Dr. Aruna Shrivastava (Govt. D.B. Girls PG College Raipur C.G.)	
5.	Corporate/ Industrial area Representative	Shri Manish Jain (Apollo College, Durg C.G.)	
6.	Ex Meritorious Student PG	Devika Janghel	
7.	Subject expert from other Department	Dr. Divya Minz (Department of Zoology, Govt. V.Y.T. PG. Autonomous College Durg C.G.)	

GOVT. V.Y.T.PG AUTONOMOUS COLLEGE, DURG (CG)
FOUR YEAR UNDERGRADUATE PROGRAM
DEPARTMENT OF BOTANY
COURSE CURRICULUM 2025-26

PART A: INTRODUCTION

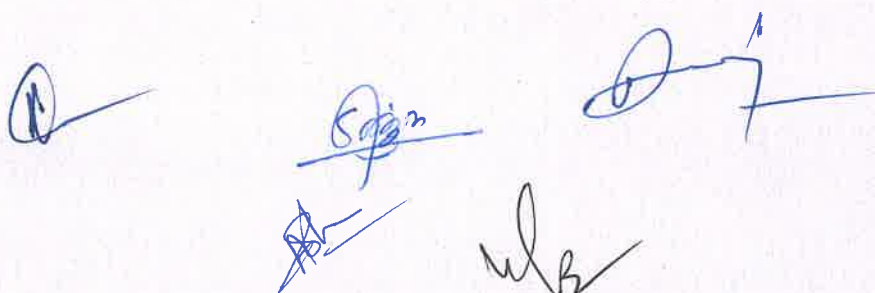
Program:		Class: B.Sc.	Semester - II	Session: 2025-26
1	Course Code	BOSEC-01		
2	Course Title	Gardening and Floriculture		
3	Course Type	Skill Enhance Course (BOSEC 01)		
4	Course Learning Outcome (CLO)	This Course will enable the students to: • Understand the concept of Gardening and Floriculture • learn about the gardening technique and familiar with gardening tools • Adopt the skill of gardening as well as floriculture. • Student may develop entrepreneurship in the field.		
5	Credit Value	2 Credits (1C+1C)	=15 Hours – Theoretical learning and =30 Hours Laboratory or Field learning/Training	
6	Total Marks	Maximum Marks :50		Minimum Passing Marks:20

PART B: CONTENT OF THE COURSE

Total no. of Teaching/ Learning Periods

Theory- 15 Periods (15 Hrs) and Lab or Field learning Training 30 Periods (30 Hours)

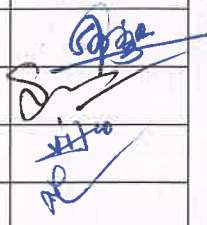
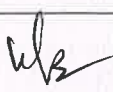
Unit	Topics (COURSE CONTENTS)	No. of Periods
Theory Contents	1. Concept & Types of Gardens: Concept of Garden & Landscape Gardening. Styles of garden - Formal & Informal Garden, Free style gardens, home garden, Hanging Garden; Types of gardens - English, Mughal, Babylonian Garden. Observation & Practical. 2. Garden plants: Ornamental plants -Shrubbery, Fernery, Arches (climbers and Creepers), Pergolas, Edges & Hedges and Pot plants, Cacti and Succulents plants, Flower borders and beds, Ground covers and carpet beds /Observation&practical. 3. Floriculture: Present situation & scope in India. Various (Types of flowers Seasonal flowers, Cut flowers Flower Crops -Rose, Chrysanthemum, Camation, Gerbera, Gladioli, Tuberose, Aster, Lilly, Dahlia and Marigold. (Observation&Practical.	15



Lab/Field Training Contents	1. Familiarization with different tools and equipments used in gardening work. 2. Design and Plotting of Garden and Preparation of Soil for Garden 3. Soil decontamination techniques, Planting methods, Fertigation method 4. Propagation techniques for selected ornamental plants, Weed management. 5. Harvesting techniques, post-harvest handling, Pre cooling, Pulsing, Packing. 6. Preparation of composite mixture and manuring practice in nursery and pots. 7. Practice in budding, cutting, layering and grafting etc. 8. Practice of Flower arrangements, lower bouquet.	30
Keywords	Garden, Flower, Floriculture, Garden Tools	
PART-C: Learning Resources		
Text Books, Reference Books and Others		
Text Books Recommended • Randhawa, G. S. and Mukhopadhyay, A. (1986) "Floriculture in India" Allied Publisher (India) • Bhattacharjee, S. K (2006) "Advances in Ornamental Horticulture" Volsi-VI Pointer Publishers • Lauria, A and Victor, H. R (2001) "Floriculture - Fundamentals and Practices. Agrobios • Sabina, G. T. and Peter, K. V. (2005) "Ornamental Plants or Gardens" New India publication India.		
Online Resources • e-Resources /e-books and e-learning portals • www.sNavam.ac.in • ww.inuacin • mw.iitm.ac.in • www.eskillindia.org • www.eshiksha.mp.gov.in • HNW.aBab.coin • www.Internshala.com • www.ndl.iitkgp.ac.in		
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 (CLA): 15 Marks by Course Coordinators	Internal Test/Quiz(2): 10 & 10 Assignments /Seminar +Attendance: 05 Total Marks- 10	Better marks out of the two test/Quiz +obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE): 35 Marks	Laboratory /Field Skill Performance: On spot Assessment • Performed the Task based on learned skill: 20 Marks • Spotting based on tools (written): 10 Marks • Viva-voce (Based on principle/technology): 05 Marks	Managed by Coordinator as per skilling

Name & Signature of Members of Board of Studies

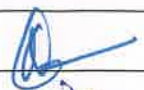
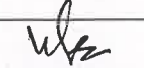
S. No.	Category	Name of Nominated Members	Signature
1.	Chairperson	Dr. G. S. Thakur	
2.	Members	Dr. Shriram Kunjam	
		Dr. Satish Kumar Sen	
		Dr. Vijay Laxmi Naidu	
		Motiram Sahu	
		Dr. Rajeshwari Prabha Lahare	
3.	Subject specialist	1. Prof. P.C. Panda Retd. Professor Borsi Durg C.G.)	
		2. Dr. N.B. Singh (Govt. N.PG. Science College Raipur C.G.)	
4.	VC Nominated member	Dr. Aruna Shrivastava (Govt. D.B. Girls PG College Raipur C.G.)	
5.	Corporate/ Industrial area Representative	Shri Manish Jain (Apollo College, Durg C.G.)	
6.	Ex Meritorious Student PG	Devika Janghel	
7.	Subject expert from other Department	Dr. Divya Minz (Department of Zoology, Govt. V.Y.T. PG. Autonomous College Durg C.G.)	

GOVT. V.Y.T.PG AUTONOMOUS COLLEGE DURG
FOUR YEAR UNDERGRADUATE PROGRAM
DEPARTMENT OF BOTANY
COURSE CURRICULUM 2025-26

Part A: Introduction			
Program: Bachelor in Life Sciences (Diploma/Degree/Honors)		Semester - III	Session: 2025-26
1	Course Code	BOSC – 03 T	
2	Course Title	Archegoniate and Fossils	
3	Course Type	Discipline Specific Course (DSC)	
4	Pre-requisite (if, any)	As per program	
5	Course Learning Outcome (CLO)	Students will be familiar with amphibians and reptiles plants ▪ Progressive evolution in plants ▪ Relics of past plants ▪ Diversity in plants ▪ Development of seeds.	
6	Credit Value	3 Credits	1 Credit =15 Hours – Learning and Observation
7	Total Marks	Maximum Marks: 100	Minimum Passing Marks: 40
Part B: Content of the Course			
Total No. of Teaching/ Learning Periods (1 Hr. per Period) = 45 Periods (45 Hours)			
Unit	Topics (Course Contents)		No. of Periods
I	Bryophyta: Morphology, structure, reproduction and life history, distribution, classification, evolution of gametophytes and sterilization of sporogenous tissue. General account of-Riccia, Marchantia, Anthoceros and Funaria, Economic and ecological importance of bryophytes.		12
II	Pteridophytes: Morphology, anatomy and reproduction, classification, evolution of stele, heterospory, telome theory and origin of seed habit, general account and life history of of Psilotum, Lycopodium, Sellaginella, Equisetum Pteris, Marsilea		11
III	Gymnosperm: Characteristics of Gymnosperms, the vessel-less & fruitless seed plants, Classification of Gymnosperm; Polyembryony in Gymnosperms and its role; Distribution of Gymnosperm in India; Economic importance of Gymnosperm. General account of Cycas, Pinus, Gnetum Concepts of living fossil (Cycas & Ginkgo); Angiospermic characters of Gnetum.		11
IV	Fossil and fossilization, types of fossils Geological time table, Brief account of the families of Pteridospermales -Rhynia, Calamites. General Account and Affinities – Cycadeoidales, Pentoxylales and Cordaitales		11
Keywords	Archegonia, seedless, heterospory, fossils		



Name & Signature of Members of Board of Studies

S. No.	Category	Name of Nominated Members	Signature
1.	Chairperson	Dr. G. S. Thakur	
2.	Members	Dr. Vijay Laxmi Naidu	
		Dr. Satish Kumar Sen	
		Dr. Shriram Kunjam	
		Mr. Motiram Sahu	
		Dr. Rajeshwari Prabha Lahare	
3.	Subject specialist	1. Prof. P.C. Panda Retd. Professor Borsi Durg C.G.)	
		2. Dr. N.B. Singh (Govt. N.PG. Science College Raipur C.G.)	
4.	VC Nominated member	Dr. Aruna Shrivastava (Govt. D.B. Girls PG College Raipur C.G.)	
5.	Corporate/ Industrial area Representative	Shri Manish Jain (Apollo College, Durg C.G.)	
6.	Ex Meritorious Student PG	Devika Janghel	
7.	Subject expert from other Department	Dr. Divya Minz (Department of Zoology, Govt. V.Y.T. PG. Autonomous College Durg C.G.)	

Part C - Learning Resources

Text Books, Reference Books, Other Resources

Text Books Recommended :

1. Puri, P. (1980) Bryophytes, Atma Ram and Sons, Delhi.
2. Vashishtha, B. R. (2005) Pteridophytes S. Chand and Co., Delhi.
3. Bhatnagar, S. P., Moitra, A. (1996) Gymnosperms, New Age International Pvt. Ltd., New Delhi.

Reference Books

1. Sporne, K. K. (1991) The Morphology of Gymnosperm. B. I. Publishing Pvt. Ltd., Bombay.
2. Stewart, W. N. and Ruthwell, G. W. (1993) Paleobotany and the Evolution of Plants. Cambridge Univ. Press, UK.
3. Singh, H. (1978) Embryology of Gymnosperms; Encyclopedia of Plant Anatomy X. Gebruder Bortraeger, Berlin.

Online Resources: (e- Resources/ e- Books/ e- Learning Portals)

e-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/ e- learning portals)

- ✓ <https://study.com/learn/lesson/bryophytes-characteristics-examples.html>
- ✓ [https://bio.libretexts.org/bookshelves/introductory_and_general_biology/book%3A_general_biology_\(boundless\)/26%3A_seed_plants/26.02%3A_gymnosperms/26.2a%3A_characteristics_of_gymnosperms](https://bio.libretexts.org/bookshelves/introductory_and_general_biology/book%3A_general_biology_(boundless)/26%3A_seed_plants/26.02%3A_gymnosperms/26.2a%3A_characteristics_of_gymnosperms)
- ✓ <https://www.google.com/search?q=fossils&scaesv09379ecd0b6efd91&rlz=1c1chbdenin10911n1093&sxsrf=acqvn09vtjzqrgwbydxp0sozfxgrnmfcw%3a1713546819943&ei=q6yizvefode5vr0ptmuvqag&oq=fossils&gslp=egxnd3mtd216lxnlnaib2zvc3npbhmqaggamg0qabiabbixaxhdgiofmgoqlhiabbhdgiofmquqabiabdifeaayaqb raagiaemgoqabiabbhdgiofmquqabiabdifeaayaqybraagiaemguqabiabehkhiaawpiucab4ajabajgbgwkgayclqgef mc41lj4aqhiaqd4aagyagegauklwgikecmqyqayjxikbcicbbajgcfaheqlhiabbixaxjrxidarjhacicc baagiaegledwgikeaayaqyfbihapgdajihbtaumv400afsww&sclient-gws-wiz-serp>
- ✓ <https://www.google.com/search?q=fossils&scaesv=09379ecd0b6efd91&rlz=1c1chbdenin10911n1093&sxsrf=acqvn09vtjzqrgwbydxp0sozfxgrnmfcw%3a171354681994346yizvefode5vr0ptmuvqag&oq=fossils&gslp=egxnd3mtd216lxnlnaib2zvc3npbhmqaggamg0qabiabbixaxhdgiofmgoqlhiabbhdgiofmquqabiabdifeaayaqybraagiaemgoqabiabbhdgiofmquqabiabdifeaayaqybraagiaemguqabiabehkhiaawpiucab4ajabajgbgwkgayclqgefmc41lj4aqhiaqd4aagyagegauklwgikecmqyqayjxikbcicbbajgcfaheqlhiabbixaxjrxidarjhacicc baagiaegledwgikeaayaqyfbihapgdajihbtaumv400afsww&sclient-gws-wiz-serp>



- ✓ <https://www.google.com/search?q=pteridophytes&scaesv=09379ecd0b6efd91&rlz=1c1chbdenin10911n1093&sxsrf=acqvn0-v0lp75qzg3sbfkrfltxb0gpdzya%3a1713546628592&ei=hkuizuvfi9q-jumpkrdkay&oq=pter&gslp=egxnd3mtd216lxnlcnaibhb0zxiqaggamg0qabiabbixahdgiomgoqabiabbhdgiomgoqabiabbhdgiomgoqabiabbhdgiomguqabiabdikeaayaqyqxikbtinec4ygaqysqmyqxikbtifec4ygaqychaagiaegemyiguychaagiaegemyigviihqafixcnaaeacqaqcyafqboagibqobbtaumi4yuaebvaeaaebmaieoalgbsicchajgiaegccyigxcagqqixgnwgikec4ygaqyqxikbzgdajihbtaumi4voafosg&sclient-gws-wiz-serp>
- ✓ [https://bio.libretexts.org/bookshelves/introductory_and_general_biology/book%3a_general_biology_\(bound_less\)/26%3a_seed_plants/26.02%3a_gymnosperms/26.2a%3a_characteristics_of_gymnosperms](https://bio.libretexts.org/bookshelves/introductory_and_general_biology/book%3a_general_biology_(bound_less)/26%3a_seed_plants/26.02%3a_gymnosperms/26.2a%3a_characteristics_of_gymnosperms)

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	Better marks out of two test / Quiz + Obtains Marks in assignment shall considered against 30 Marks
	Assignment/Seminar + Attendance –	10	
	Total Marks	– 30	

End Semester Exam (ESE): 70

Two Section – A & B

Section A: Q1. Objectives -10x1 = 10 Marks; Q2. Short Answer Type- 5x4 = 20Marks

Section B: Descriptive answer type question 1 out of 2 from each unit- 4x10 = 40 Marks

[Handwritten signatures and marks]

GOVT. V.Y.T.PG AUTONOMOUS COLLEGE DURG
FOUR YEAR UNDERGRADUATE PROGRAM
DEPARTMENT OF BOTANY
COURSE CURRICULUM 2025-26
Lab Course

Part A: Introduction			
Program: Bachelor in Life Sciences <i>(Diploma/Degree/Honors)</i>		Semester -III	Session: 2025-26
1	Course Code	BOSC - 03	
2	Course Title	Lab. Course 03 (Archegoniate and Fossils)	
3	Course Type	Laboratory Course	
	Pre-requisite (if, any)	As per program	
4	Course Learning Outcome (CLO)	At the end of the course students will be familiar ▪ With amphibians and reptiles plants ▪ Progressive evolution in plants ▪ Relics of past plants ▪ Diversity in plants ▪ Development of seeds.	
5	Credit Value	1Credit	1 credit =30 Hours – Laboratory or field learning/Training
6	Total Marks	Maximum Marks: 50	Minimum Passing Marks: 20
Part B: Content of the Course			
Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)			
S.No.	List of Experiments		
Lab./Field Training/E xperiment Contents of course	Bryophyta: Comparative study of the anatomy of vegetative and reproductive parts of Marchantia, Pellia, Anthoceros, Notothylus, Funaria, Polytrichum. Pteridophyta: Comparative study of the anatomy of vegetative and reproductive parts of Psilotum, Lycopodium, Selaginella, Equisetum, Gleichenia, Pteris, Ophioglossum, Isoetes. Gymnosperms: Comparative study of the anatomy of vegetative and reproductive parts of Cycas, Ginkgo, Cedrus, Abies, Picea, Cupressus, Araucaria, Cryptomeria, Taxodium, Podocarpus, Agathis, Taxus, Ephedra and Gnetum. ➤ Collection of various gymnospermic plant materials. ➤ Field work - as far practicable conveniently. Fossil: Study of important fossil gymnosperms from prepared photographs, slides and specimens.		30
Keywords	Archegonia, Venter, Bryophytes, Pteridophytes		



Part C: Learning Resources

Text Books, Reference Books, Other Resources

TEXT BOOKS Recommended:

1. The Practical Fossil Finder (Practical Handbook) Hardcover - 1 October 1991 by Steve Parker (Author) Publishers Facts On File Inc
2. Practical Botany (Part I) ISBN #:81-301-0008-8 Sunil D Purohit, Gotam K Kukda & Anamika Singhvi Edition:2013 Apex Publishing House Durga Nursery Road, Udaipur, Rajasthan (bilingual).
3. Pandey S.K. (2012). Quick Concept of Botany. Publisher LAP LAMBERT Academic Publishing GmbH & Co. KG, Germany (ISBN: 978-3-8484-3104-5).
4. Dubey, R. C. and Maheshwari. D.K. 2012. Practical Microbiology, S. Chand & Company, Pvt. Ltd., New Delhi.
5. Pandey. B.P. 2014 Modern Practical Botany, (Vol-I) S. Chand and Company Pvt. Ltd., New Delhi.

Reference Books:

1. Principles of Paleontology Edition 3 Paperback-1 January 2006 by Arnold Miller, Michael Foote Publishers - W.H.Freeman & Co Lt

Online Resources: (e- Resources/ e- Books/ e- Learning Portals)

- ✓ e-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
- 1. <https://efaidnbmnnnibpcajpcglclefndmkaj/https://egyankosh.ac.in/bitstream/123456789/69611/1/Unit-9.pdf>
- 2. <https://www.encyclopedia.com/science/encyclopedias-almanacs-transcripts-and-maps/fossil-and-fossilization>
- 3. <https://palaeobotany.org>

PART D: ASSESSMENT AND EVALUATION

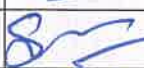
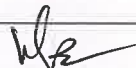
Suggested Continuous Evaluation Methods:

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



Continuous Internal Assessment (CIA): 15 Marks (By Course Teacher)	Internal test/Quiz-(2): 10 Assignment/Seminar + Attendance – 05 Total Marks- 15	Better marks out of two Test / Quiz + obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE): 30 Marks	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 & Signature of Members of Board of Studies

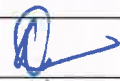
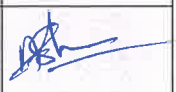
S. No.	Category	Name of Nominated Members	Signature
1.	Chairperson	Dr. G. S. Thakur	
2.	Members	Dr. Vijay Laxmi Naidu	
		Dr. Satish Kumar Sen	
		Dr. Shriram Kunjam	
		Mr. Motiram Sahu	
		Dr. Rajeshwari Prabha Lahare	
3.	Subject specialist	1. Prof. P.C. Panda Retd. Professor Borsi Durg C.G.)	
		2. Dr. N.B. Singh (Govt. N.PG. Science College Raipur C.G.)	
4.	VC Nominated member	Dr. Aruna Shrivastava (Govt. D.B. Girls PG College Raipur C.G.)	
5.	Corporate/ Industrial area Representative	Shri Manish Jain (Apollo College, Durg C.G.)	
6.	Ex Meritorious Student PG	Devika Janghel	
7.	Subject expert from other Department	Dr. Divya Minz (Department of Zoology, Govt. V.Y.T. PG. Autonomous College Durg C.G.)	

GOVT. V.Y.T.PG AUTONOMOUS COLLEGE DURG
FOUR YEAR UNDERGRADUATE PROGRAM
DEPARTMENT OF BOTANY
COURSE CURRICULUM 2025-26

PART A: INTRODUCTION			
Program: Bachelor in Life Sciences (Diploma/Degree/Honors)		Semester – IV	Session: 2025-26
1	Course Code	BOSC – 04 T	
2	Course Title	Angiosperms	
3	Course Type	Discipline Specific Course (DSC)	
4	Pre-requisite (if, any)	As per program	
4	Course Learning Outcome (CLO)	At the end of the course, the students will be able: ▪ Understand basics of plant identification, classification and nomenclature ▪ Understand the concept, diversity and evolution of Angiosperm plants. ▪ Become familiar with the internal structure of plants and concept of plant tissues with its revolutionary concept. ▪ Understand the reproductive system in flowering plants.	
5	Credit Value	3 Credits	1 Credit =15 Hours – Learning and Observation
6	Total Marks	Maximum Marks: 100	Minimum Passing Marks: 40
Part B: Content of the Course			
Total No. of Teaching/ Learning Periods (1 Hr. per Period) = 45 Periods (45 Hours)			
Unit	Topics (Course Contents)		No. of Periods
I	Plant taxonomy: Types of classification-artificial, natural and phylogenetic Bentham & Hooker (upto series), Engler & Prantl (upto series) and Hutchinson system of classification with its merit and demerits, Modern trends of taxonomy and Numerical taxonomy. Binomial nomenclatur system.. Principles and rules (ICBN/ICN) Ranks and names, Typification, author citation, vali publication, principle of priority and its limitations;. Herbarium technique, important herbaria, herbarium and Botanical gardens of India.		12
II	Taxonomic Description: Characteristics, systematics and economic importance of Dicotyledonous families- Brassicaceae, Malvaceae, Fabaceae (subfamily), Apiaceae, Rutaceae, Euphorbiaceae, Lamiaceae, Asteraceae. Monocotyledonous families -Orchidaceae, Liliaceae, Cyperaceae, Musaceae and Poaceae. (Floral features, Floral formulaand floral diagram are essential]		11

III	Anatomy: Tissue system features, functions of different types of meristematic and permanent tissues. Internal Structure of dicot and monocot root stem and leaf. Root and shoot apex organization: Structure and function of cambium and secondary growth in root and stem. Wood (heartwood and sapwood, annual rings) Abnormal Secondary Growth (Dracaena Achyranthes, Nyctanthes, Boerhavia)	11
IV	Embryology: Structure of anther and pollen. Structure and types of ovules, Embryo sacs-types Pollination and Fertilization, Double fertilization, Endosperm types, structure and functions Development of embryo-Dicot and monocot embryo. Concept of Apomixes and Polyembryony, Seed structure; appendages and dispersal mechanisms.	11
Keywords	<i>Taxonomy, Herbarium, Tissue, Fertilization</i>	

Name & Signature of Members of Board of Studies

S. No.	Category	Name of Nominated Members	Signature
1.	Chairperson	Dr. G. S. Thakur	
2.	Members	Dr. Vijay Laxmi Naidu	
		Dr. Satish Kumar Sen	
		Dr. Shriram Kunjam	
		Mr. Motiram Sahu	
		Dr. Rajeshwari Prabha Lahare	
3.	Subject specialist	1. Prof. P.C. Panda Retd. Professor Borsi Durg C.G.)	
		2. Dr. N.B. Singh (Govt. N.PG. Science College Raipur C.G.)	
4.	VC Nominated member	Dr. Aruna Shrivastava (Govt. D.B. Girls PG College Raipur C.G.)	
5.	Corporate/ Industrial area Representative	Shri Manish Jain (Apollo College, Durg C.G.)	
6.	Ex Meritorious Student PG	Devika Janghel	
7.	Subject expert from other Department	Dr. Divya Minz (Department of Zoology, Govt. V.Y.T. PG. Autonomous College Durg C.G.)	

PART C - LEARNING RESOURCES

Text Books, Reference Books, Other Resources

TEXT BOOKS Recommended :

Text Books Recommended –

1. Simpson, M.G. (2006) Plant Systematics. Elsevier Academic Press, San Diego, CA, USA
2. Beck, C.B. (2010). An Introduction to Plant Structure and Development, II edition.
3. Johri, B.M. (1984). Embryology of Angiosperms. Springer-Verlag, Berlin
4. Singh, G. (2012) Plant Systematics. Theory and Practice. Oxford & IBH Pvt. Ltd, New Delhi.
5. Bhojwani, SS. & Bhatnagar, SP (2011). Embryology of Angiosperms. Vikas Publication House Pvt.Ltd. New Delhi 5 edition
6. Mauseth. 1.1) (1988) Plant Anatomy. The Benjamin Cummings Publisher. USA
7. Pandey, B. P. (LatesEdt), Plant Anatomy

Reference Books Recommended -

1. Simpson, M.G. (2006) Plant Systematics. Elsevier Academic Press, San Diego, CA, USA
2. Beck, C.B. (2010). An Introduction to Plant Structure and Development, II edition.
3. Mauseth. 1.1) (1988) Plant Anatomy. The Benjamin Cummings Publisher. USA
4. Jeffrey, C. (1982). An Introduction to Plant Taxonomy. Cambridge University Press, Cambridge
5. Judd, W.S., Campbell, C.S., Kellogg, E.A., Stevens, P.F. (2002). Plant Systematics-A Phylogenetic Approach. Sinauer Associates Inc., U.S.A. 2 nd edition.
6. Maheshwari, J.K. (1963). Flora of Delhi. CSIR, New Delhi.
7. Radford, A.E. (1986). Fundamentals of Plant Systematics. Harper and Row, New York
8. Saxena N.B. and Saxena S. (2012). Plant Taxonomy Pragati Prakashan.
9. Sharma O.P. (2013). Plant Taxonomy. MC GRAW HILL INDIA.
10. Sharma, M.K. (2013) Plant Structures (An Introduction to Plant Anatomy). VayuEducation of India.
11. Chopra G.L. (2005) Angiosperm, Pradeep Publication, Jalandhar.

Online Resources: (e- Resources/ e- Books/ e- Learning Portals)

- 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

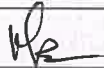
Online Resources: e-Resources / e-books and e-learning portals

- <https://www.fs.usda.gov/managingland/wildflowers/pollinators/whatispollinationhttps://www.pw.li ve/exams/neet/embryo/#:~:text=Dicot%20and%20monocot%20embros%20develop,one%20that%20is%20significantly%20smaller.>
- <https://byjus.com/biology/apomixis/>
- <https://examupdates.in/plant-anatomy-and-embryology-book>

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): 15 By Course Teacher	Internal Test/Quiz (2): 20 & 20 Assignment/Seminar + Attendance – 10 Total Marks – 30	Better marks out of two test / Quiz + Obtains Marks in assignment shall considered against 30 Marks
End Semester Exam (ESE): 35	Two Section A & B Section A: Q1. Objectives -10x1=10 Marks Q2. Short answer Type- 5x4=20Marks Section B: Descriptive answer type qts. 1 out of 2 from each unit-4x10=40 Marks	

S. No.	Category	Name of Nominated Members	Signature
1.	Chairperson	Dr. G. S. Thakur	
2.	Members	Dr. Vijay Laxmi Naidu	
		Dr. Satish Kumar Sen	
		Dr. Shriram Kunjam	
		Mr. Motiram Sahu	
		Dr. Rajeshwari Prabha Lahare	
3.	Subject specialist	1. Prof. P.C. Panda Retd. Professor Borsi Durg C.G.)	
		2. Dr. N.B. Singh (Govt. N.PG. Science College Raipur C.G.)	
4.	VC Nominated member	Dr. Aruna Shrivastava (Govt. D.B. Girls PG College Raipur C.G.)	
5.	Corporate/ Industrial area Representative	Shri Manish Jain (Apollo College, Durg C.G.)	
6.	Ex Meritorious Student PG	Devika Janghel	
7.	Subject expert from other Department	Dr. Divya Minz (Department of Zoology, Govt. V.Y.T. PG. Autonomous College Durg C.G.)	

GOVT. V.Y.T.PG AUTONOMOUS COLLEGE DURG
FOUR YEAR UNDERGRADUATE PROGRAM
DEPARTMENT OF BOTANY
COURSE CURRICULUM 2025-26
Lab Course

PART A: INTRODUCTION				
Program:		Semester - IV		Session: 2025-26
1	Course Code	BOSC -04		
2	Course Title	Lab. Course - 04 (Angiosperms)		
3	Course Type	Laboratory Course		
4	Pre-requisite (if, any)	As per program		
5	Course Learning Outcome (CLO)	At the end of this course, students will be able to: ▪ Understand the systematic status of flowering plants. ▪ Learn collection of local flora, identification and herbarium preparation. ▪ Understand internal structure of different plant parts. ▪ Understand the pollination and seed dispersal mechanism. ▪ Understand about reproduction system in flowering plants.		
6	Credit Value	1Credit	1 credit =30 Hours Laboratory or Field learning/Training	
7	Total Marks	Maximum Marks: 50		Minimum Passing Marks: 20
Part B: Content of the Course				
Total No. of Teaching/ Learning Periods (1 Hr. per Period) = 45 Periods (45 Hours)				
S. No.	List of Experiments			
Lab./Field Training/Experiment Content of Course	▪ Description of local plants of the syllabus in semitechnical language, floral formula and floral diagrams should be drawn. ▪ Preparation of herbarium of local flora. ▪ Anatomy of primary and secondary growth in monocots and dicots stem using hand sections or permanent slides. ▪ Anatomy of root, primary and secondary structure. ▪ Study of placentation. ▪ Study of types of ovule in permanent slide. ▪ Isolation of globular, heart shape and torpedo embryo. ▪ Study of pollination by insects.			30
Keywords	Herbarium, Monocots, Placentation, Pollination			

Part C: Learning Resources**Text Books, Reference Books, Other Resources****Text Books Recommended:**

1. Pandey, B.P. (2014). Modern Practical Botany Vol. II. S. Chand and Company Ltd., New Delhi.
2. Bendre, A.M. and Kumar A. (2003). Manual of Practical Botany Vol. II. Rastogi Publications, Meerut.
3. Santra S.C. and Chatterjee (2005). College Botany Practical Vol. II New Central Book Agency Pvt. Ltd

Online Resources:

- ✓ (e- Resources/ e- Books/ 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://visiblebody.com/learn/biology/monocot-dicot/roots>
- ✓ <https://www.toppr.com/guides/biology/differences-between/monocot-and-dicot-stem/>
- ✓ <https://examupdates.in/plant-anatomy-and-embryology-book/>
- ✓ [https://jrs.ac.in/working folder/download-d-12-180-618c09f700115.pdf](https://jrs.ac.in/working%20folder/download-d-12-180-618c09f700115.pdf)

Part D: Assessment and Evaluation**Suggested Continuous Evaluation Methods:**

Maximum Marks: 50 Marks

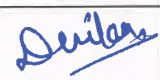
Continuous Internal Assessment (CIA): 15 Marks

End Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): 15 Marks (By Course Teacher)	Internal test/Quiz-(2): 10 & 10 Assignment/Seminar + Attendance – 05 Total Marks- 15	Better marks out of two Test/ Quiz + obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE): 30 Marks	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 & Signature of Members of Board of Studies

S. No.	Category	Name of Nominated Members	Signature
1.	Chairperson	Dr. G. S. Thakur	
2.	Members	Dr. Vijay Laxmi Naidu	
		Dr. Satish Kumar Sen	
		Dr. Shriram Kunjam	
		Mr. Motiram Sahu	
		Dr. Rajeshwari Prabha Lahare	
3.	Subject specialist	1. Prof. P.C. Panda Retd. Professor Borsi Durg C.G.)	
		2. Dr. N.B. Singh (Govt. N.PG. Science College Raipur C.G.)	
4.	VC Nominated member	Dr. Aruna Shrivastava (Govt. D.B. Girls PG College Raipur C.G.)	
5.	Corporate/ Industrial area Representative	Shri Manish Jain (Apollo College, Durg C.G.)	
6.	Ex Meritorious Student PG	Devika Janghel	
7.	Subject expert from other Department	Dr. Divya Minz (Department of Zoology, Govt. V.Y.T. PG. Autonomous College Durg C.G.)	

FOUR YEAR UNDERGRADUATE PROGRAM

SEMESTER III & IV

SESSION 2025-26

SUBJECT - BOTANY

DSE

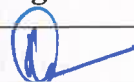
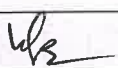
GOVT. V.Y.T.PG AUTONOMOUS COLLEGE DURG
FOUR YEAR UNDERGRADUATE PROGRAM
DEPARTMENT OF BOTANY
COURSE CURRICULUM 2025-26

PART A: Introduction				
Program: Bachelor in Life Sciences (Diploma/Degree/Honors)		Semester - III		Session: 2025-26
1	Course Code	BOSE – 01 T		
2	Course Title	Natural Resources and Management		
3	Course Type	Discipline Specific Elective (DSE)		
4	Course Learning Outcome (CLO)	At the end of this course, the students will be able to • Understand natural resources and their sustainable utilization. • Knowledge on land, water, energy, and forest resources. • Students will learn about the practices of natural resource management. • Knowledge on the international and national efforts of natural resource management.		
5	Credit Value	3 Credits	1 Credit =15 Hours – Learning and Observation	
6	Total Marks	Maximum Marks: 100		Minimum Passing Marks: 40
PART B: CONTENT OF THE COURSE				
Total No. of Teaching/ Learning Periods (1 Hr. per Period) = 45 Periods (45 Hours)				
Unit	Topics (Course Contents)			No. of Periods
I	Natural resources ▪ Definition and types. ▪ Natural resources' conservation Role of an individual in conservation of natural recourses, Significance, ▪ Sustainable utilization of resources': Concept, approaches economic, ecological, and socio-cultural activities.			12



II	Land and freshwater resources - Land as a resource - Soil erosion and desertification - Soil degradation and management. - Forest resources use and over exploitation, deforestation - Water resources, use and overutilization of surface and ground water - Fresh Marine and estuarine ecosystems; - Wetlands threats and management strategies	11
III	Biological Resources - Biodiversity-definition and types - Value of biodiversity - Biodiversity at global, national and regional levels - Threats; Management strategies; - Bioprospecting. IPR; CBD; National Biodiversity Action Plan). - Forests: Cover and its significance (with special reference to India); - Major and minor Forest products; - Renewable and non-renewable sources of energy.	11
III	Contemporary practices in resource management - National and international efforts in resource management and conservation. - Waste management practices - Natural resource Accounting - Environmental impact assessment EIA - Geographical information System GIS - Participatory Appraisal of natural Resource - Ecological Footprint with emphasis on carbon footprint,	11
Keywords	Resources, Biodiversity, Resources management, IPR, CBD.	

Name & Signature of Members of Board of Studies

S. No.	Category	Name of Nominated Members	Signature
1.	Chairperson	Dr. G. S. Thakur	
2.	Members	Dr. Vijay Laxmi Naidu	
		Dr. Satish Kumar Sen	
		Dr. Shriram Kunjam	
		Mr. Motiram Sahu	
		Dr. Rajeshwari Prabha Lahare	
3.	Subject specialist	1. Prof. P.C. Panda Retd. Professor Borsi Durg C.G.)	
		2. Dr. N.B. Singh (Govt. N.PG. Science College Raipur C.G.)	

4.	VC Nominated member	Dr. Aruna Shrivastava (Govt. D.B. Girls PG College Raipur C.G.)	
5.	Corporate/ Industrial area Representative	Shri Manish Jain (Apollo College, Durg C.G.)	
6.	Ex Meritorious Student PG	Devika Janghel	
7.	Subject expert from other Department	Dr. Divya Minz (Department of Zoology, Govt. V.Y.T. PG. Autonomous College Durg C.G.)	

PART C - Learning Resources

Text Books, Reference Books, Other Resources

Text Books Recommended -

1. Vasudevan, N. (2006). Essentials of Environmental Science. Narosa Publishing House, New Delhi.
2. Singh, J. S., Singh, S.P. and Gupta, S. (2006). Ecology, Environment and Resource Conservation. Anamaya Publications, New Delhi.

Reference Books Recommended-

1. Rogers, P.P., Jalal, K.F. and Boyd, J.A. (2008). An Introduction to Sustainable Development. Prentice Hall of India Private Limited, New Delhi.

Online Resources-

- ✓ e-Resources / e-books and e-learning portals
- ✓ <https://www.sciencedirect.com/topics/social-sciences/natural-resource>
- ✓ <https://efaidnbmnnnibpcajpcgglefindmkaj/https://egyankosh.ac.in/bitstream/12345789/66166/2/Unit4.pdf>
- ✓ <https://efaidnbmnnnibpcajpcgglefindmkaj/https://www.ers.usda.gov/webdocs/publications/41964/30289/biological.pdf?v=0#:~:text=16-What%20Are%20Biological%20Resources%3F,forests%2C%20and%20other%20natural%20lands.>
- ✓ <http://surl.li/spcdd>
- ✓ <https://shorturl.at/ewyIP>
- ✓ <https://shorturl.at/cimoF>

Online Resources-

- ✓ e-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

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 + Attendance – 10 Total Marks – 30	Better marks out of two test / Quiz + Obtains Marks in assignment shall considered against 30 Marks
End Semester Exam (ESE): 70	Laboratory / Field Skill Performance : On Spot Assessment A. Perform the task based on lab work – 20 Marks B. Spotting Based on Tools/Technology (written) – 10 Marks C. Viva voce Based on Principle and Technology – 05 Marks	Managed by Course Teacher as per lab status

Five handwritten signatures in blue ink are visible below the table. The signatures are stylized and appear to be of different individuals. One signature on the left is a simple checkmark-like mark. The others are more complex, with some including initials or full names in cursive script.

GOVT. V.Y.T.PG AUTONOMOUS COLLEGE DURG

FOUR YEAR UNDERGRADUATE PROGRAM

DEPARTMENT OF BOTANY

COURSE CURRICULUM 2025-26

Lab Course

PART A: Introduction			
Program: Bachelor in Life Sciences (Diploma/Degree/Honors)		Semester - III	Session: 2025-26
1	Course Code	BOSE – 01 P	
2	Course Title	Lab Course (Natural Resources and Management)	
3	Course Type	Laboratory Course	
4	Course Learning Outcome (CLO)	This Course will enable the students to: ▪ To understand natural resources and their sustainable utilization. ▪ Acquire knowledge on land, water, energy, and forest resources. Students will learn about the practices of natural resource management. ▪ Acquire knowledge on the international and national efforts of natural resource management.	
5	Credit Value	1Credit	1 credit =30 Hours – Learning and Observation
6	Total Marks	Maximum Marks: 50	Minimum Passing Marks: 20
PART B: Content of the Course			
S.No.	List of Experiments		



Lab./Field Training/ Experiment	1. To compare protected and unprotected grassland stands using community coefficients 2. To estimate IVI of the species in a woodland using point centered quarter method. 3. To find out important grassland species using chi square test. 4. Scientific visits to a protected area, a wet land, a mangrove, NBPGR, BSI, CSIR, ICAR labs and a recognized botanical gardens or a museum. 5. To determine diversity indices (Shannon Wiener, concentration of dominance, species richness, equability and B diversity). 6. Field survey of a part of town or city to make the students aware of the diversity of plants in urban ecosystems. 7. Estimation of solid waste generated by a domestic system (biodegradable and non biodegradable) and its impact on land degradation. 8. Collection of data on forest covers of specific area. 9. Measurement of dominance of woody species by DBH (diameter at breast height) method. 10. Calculation and analysis of ecological footprint. 11. Ecological modeling.
Keywords	Community coefficient, IVI, diversity indices

PART C: Learning Resources

Text Books, Reference Books, Other Resources

Text Books Recommended-

1. A Handbook of Human Resource Management Practice
2. Environmental and Natural Resource Economics_ A Contemporary Approach
3. Sustainable Management of Natural Resources_ Mathematical Models and Methods
(Environmental Science and Engineering Environmental Science)

Online Resources-

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

- 1) <https://shorturl.at/uIMTW>
- 2) <https://shorturl.at/yFJM3>

Online Resources-

e-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

PART D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

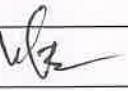
Maximum Marks:	50 Marks
Continuous Internal Assessment (CIA):	15 Marks
End Semester Exam (ESE):	35 Marks

Continuous Internal Assessment (CIA): 15 By Course Teacher	Internal Test/Quiz (2):	10 & 10	Better marks out of two test / Quiz + Obtains Marks in assignment shall considered against 15 Marks
	Assignment/Seminar + Attendance	– 05	
	Total Marks	– 15	

End Semester Exam (ESE): 35	Laboratory / Field Skill Performance : On Spot Assessment		Managed by Course Teacher as per lab status
	D. Perform the task based on lab work	– 20 Marks	
	E. Spotting Based on Tools/Technology (written)	– 10 Marks	
	F. Viva voce Based on Principle and Technology	– 05 Marks	



Name & Signature of Members of Board of Studies

S. No.	Category	Name of Nominated Members	Signature
1.	Chairperson	Dr. G. S. Thakur	
2.	Members	Dr. Vijay Laxmi Naidu	
		Dr. Satish Kumar Sen	
		Dr. Shriram Kunjam	
		Mr. Motiram Sahu	
		Dr. Rajeshwari Prabha Lahare	
3.	Subject specialist	1. Prof. P.C. Panda Retd. Professor Borsi Durg C.G.)	
		2. Dr. N.B. Singh (Govt. N.PG. Science College Raipur C.G.)	
4.	VC Nominated member	Dr. Aruna Shrivastava (Govt. D.B. Girls PG College Raipur C.G.)	
5.	Corporate/Industrial area Representative	Shri Manish Jain (Apollo College, Durg C.G.)	
6.	Ex Meritorious Student PG	Devika Janghel	
7.	Subject expert from other Department	Dr. Divya Minz (Department of Zoology, Govt. V.Y.T. PG. Autonomous College Durg C.G.)	

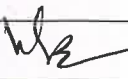
GOVT. V.Y.T.PG AUTONOMOUS COLLEGE DURG
FOUR YEAR UNDERGRADUATE PROGRAM
DEPARTMENT OF BOTANY
COURSE CURRICULUM 2025-26

PART A: Introduction			
Program: Bachelor in Life Sciences (Diploma/Degree/Honors)		Semester - IV	Session: 2025-26
1	Course Code	BOSE – 02 T	
2	Course Title	Microbiology and Phytopathology	
3	Course Type	Discipline Specific Elective (DSE)	
4	Course Learning Outcome (CLO)	At the end of this course, the students will be able to get • Basic idea of different microbes present in biotic and abiotic environment. • Knowledge of principle concept and methods in the field of Microbiology and Phytopathology • Idea of living, non living and environmental causes of plant diseases. • Knowledge of different technique to isolate microbes study their cultural characteristics,. • How disease occurs by microbes, their identification and control measures.	
5	Credit Value	3 Credits	1 Credit =15 Hours – Learning and Observation
6	Total Marks	Maximum Marks: 100	Minimum Passing Marks: 40
PART B: CONTENT OF THE COURSE			
Total No. of Teaching/ Learning Periods (1 Hr. per Period) = 45 Periods (45 Hours)			
Unit	Topics (Course Contents)		No. of Periods
I	Microbiology: ▪ General account, distribution and classification of microorganism. ▪ Major microbes of air soil water and food ▪ Isolation and cultivation of microorganism ▪ Important tools and techniques used in microbiological studies.		12

II	Plant pathology: ▪ Nature and concept of diseases in plants, ▪ History and development of plant pathology, contribution of Indian plant pathologist in India and abroad, pathology and trends in 21st century ▪ Symptom of parasitic and non-parasitic diseases, ▪ Classification of plant diseases. ▪ Important plant diseases caused by different Pathogens ▪ Plant quarantine ▪ HR and hypersensitivity	11
III	Techniques of Studying Plant Diseases: ▪ Field Studies, Collection of samples and its preservation. ▪ Sterilization technique- Standard Methods of sterilization - Physical methods, Chemical methods, Radiation methods, ▪ Isolation technique: Preparation of different media for growth of pathogen by using standard inoculation techniques like- plate streak, serial dilution and pour plate methods to obtain a pure culture. ▪ Staining Technique: Nature and Types of stains, ▪ Preservation methods of preservation of culture	11
III	Host Parasite Relation: ▪ Terms and concept ▪ Disease cycle and environmental relations ▪ Plant disease dissemination ▪ Role of enzymes and toxins in pathogenesis and mode of infection, ▪ Inoculums and inoculums potential ▪ Koch's postulates ▪ Defense mechanism in plant against pathogens, ▪ Prevention and control of plant diseases	11
Keywords	Microorganism, Disease, Pathogens, Culture	

Name & Signature of Members of Board of Studies

S. No.	Category	Name of Nominated Members	Signature
1.	Chairperson	Dr. G. S. Thakur	
2.	Members	Dr. Vijay Laxmi Naidu	
		Dr. Satish Kumar Sen	
		Dr. Shriram Kunjam	
		Mr. Motiram Sahu	

		Dr. Rajeshwari Prabha Lahare	
3.	Subject specialist	1. Prof. P.C. Panda Retd. Professor Borsi Durg C.G.) 2. Dr. N.B. Singh (Govt. N.PG. Science College Raipur C.G.)	
4.	VC Nominated member	Dr. Aruna Shrivastava (Govt. D.B. Girls PG College Raipur C.G.)	
5.	Corporate/ Industrial area Representative	Shri Manish Jain (Apollo College, Durg C.G.)	
6.	Ex Meritorious Student PG	Devika Janghel	
7.	Subject expert from other Department	Dr. Divya Minz (Department of Zoology, Govt. V.Y.T. PG. Autonomous College Durg C.G.)	

PART C - Learning Resources

Text Books, Reference Books, Other Resources

Text Books Recommended -.

1. Bridges, P. (1998) Molecular Variability of Fungal Pathogens. CAB
2. Bilgrami, K. S. and Dubey, H. C. (1985) Plant Pathology, Vikas Publ. House, Sahibabad U.P.
3. Ali, s. s. and Kulshereshta, p. (1986) plant pathology, adeeb educational, Raipur.
4. Singh, R. S. (1980) Plant Pathology, Oxford IBH Publ. Co, New Delhi.
5. Malhotra R. Plant Pathology Publisher: McGraw Hill Education India

Reference Books Recommended-

1. Agrios, G. N. (1997) Plant Pathology, Academic Press, London

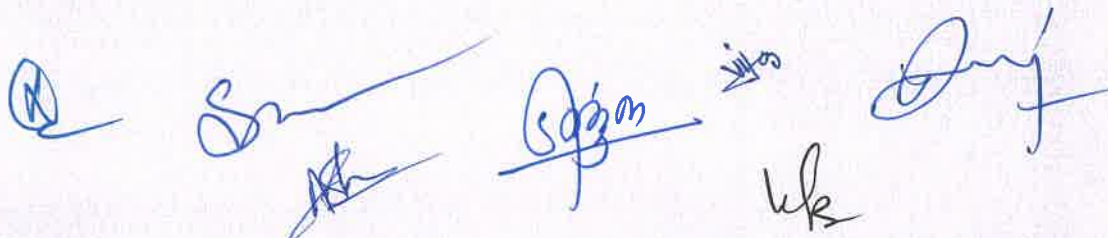
Online Resources-

- ✓ e-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://www.sciencedirect.com/topics/agricultural-and-biological-sciences/plant-pathology#:~:text=Plant%20pathology%20is%20a%20science,parasitic%20microorganis%20that%20cause%20disease.>
- ✓ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4600171/>
- ✓ <https://bnrc.springeropen.com/articles/10.1186/s42269-021-00627-6>
- ✓ <https://www.sciencedirect.com/science/article/abs/pii/S0065308X08604339>
- ✓ <https://www.researchgate.net/publication/371501301> Fundamentals of Plant Pathology

The bottom of the page features several handwritten signatures and initials in blue ink. From left to right, there is a circular stamp with the letter 'N', a signature that appears to be 'S...', a signature that looks like 'Sagim', a small mark resembling '1/10', a signature that looks like 'Ding', and the initials 'uk'.

PART D: Assessment and Evaluation			
Suggested Continuous Evaluation Methods:			
Maximum Marks:		100 Marks	
Continuous Internal Assessment (CIA):		30Marks	
End Semester Exam (ESE):		70 Marks	
Continuous Internal Assessment (CIA): 30 By Course Teacher	Internal Test/Quiz (2):	20 & 20	Better marks out of two test / Quiz + Obtains Marks in assignment shall considered against 30 Marks
	Assignment/Seminar + Attendance – 10		
	Total Marks	– 30	
End Semester Exam (ESE): 70	Laboratory / Field Skill Performance : On Spot Assessment		Managed by Course Teacher as per lab status
	G. Perform the task based on lab work – 20 Marks		
	H. Spotting Based on Tools/Technology (written) – 10 Marks		
	I. Viva voce Based on Principle and Technology – 05 Marks		

GOVT. V.Y.T.PG AUTONOMOUS COLLEGE DURG

FOUR YEAR UNDERGRADUATE PROGRAM

DEPARTMENT OF BOTANY

COURSE CURRICULUM 2025-26

Lab Course

PART A: Introduction			
Program: Bachelor in Life Sciences (Diploma/Degree/Honors)		Semester - IV	Session: 2025-26
1	Course Code	BOSE – 02 P	
2	Course Title	Lab Course 02 (Microbiology and Phytopathology)	
3	Course Type	Laboratory Course	
4	Course Learning Outcome (CLO)	This Course will enable the students to: ▪ Basic Idea of Microbes ▪ Culture of Microbes in the Laboratory ▪ How Disease occurs by Microbes ▪ Basic Idea of Host Parasite Interrelation Ship ▪ Control Measures of Pathogen by different biological Sources	
5	Credit Value	1Credit	1 credit =30 Hours – Learning and Observation
6	Total Marks	Maximum Marks: 50	Minimum Passing Marks: 20
PART B: Content of the Course			
S.No.	List of Experiments		



Lab./Field Training/ Experiment	▪ Calibration of microscope. ▪ Study of symptoms of various plants disease caused by viruses, bacteria and fungi. ▪ Sterilization of glass wares by detergent, chromic acid and dry sterilization ▪ Preparation and sterilization of culture media NAM, PDA, to culture bacteria and fungi respectively. ▪ Isolation of micro-organism from soil, water and air by using standard inoculation technique. ▪ Identification of the isolated fungi by slide preparation. ▪ Micrometry - measurement of length and width of spore/ conidia of the isolated /given fungi. ▪ Preparation of camera lucida diagram of the isolated / given fungi. ▪ Cultural charecteristics the the cultured bacteria. ▪ Gram staining of Bacteria ▪ Host parasite relationship- slide preparation of infected /diseased portion of the host to study host parasite relationship by smearing and section cutting methods isolated from local field. ▪ Demonstration of the effect of various bio-pesticides (essential oils, neem, turmeric and garlic) against microbe/pathogens ▪ Preparation of herbarium of different plant diseases of local area
Keywords	Disease, Symptoms, Host, Medium, Pathogenesis








PART C: Learning Resources

Text Books, Reference Books, Other Resources

Text Books Recommended -

1. Experiments In Microbiology, Plant Pathology And Biotechnology By K. R. Aneja. Publisher New Age International

Online Resources-

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

1. <https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/plant-pathology#:~:text=Plant%20pathology%20is%20a%20science,parasitic%20microorganism%20that%20cause%20disease.>
2. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4600171/>
3. <https://bnrc.springeropen.com/articles/10.1186/s42269-021-00627-6>
4. <https://www.sciencedirect.com/science/article/abs/pii/S0065308X08604339>
5. <https://www.researchgate.net/publication/371501301> Fundamentals of Plant Pathology

Online Resources-

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

- ✓ <https://efaidnbmnnnibpcajpcgiclfindmkaj/https://mis.alagappauniversity.ac.in/siteAdmin/dde->
- ✓ <https://admin/uploads/3/PG M.Sc. Botony 34631%20MICROBIOLOGY%20AND%20PLANT%20PATHOLOGY.pdf>

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 two test / Quiz + Obtains Marks in assignment shall considered against 15 Marks
End Semester Exam (ESE): 35	Laboratory / Field Skill Performance : On Spot Assessment J. Perform the task based on lab work – 20 Marks K. Spotting Based on Tools/Technology (written) – 10 Marks L. Viva voce Based on Principle and Technology – 05 Marks	Managed by Course Teacher as per lab status



Name & Signature of Members of Board of Studies

S. No.	Category	Name of Nominated Members	Signature
1.	Chairperson	Dr. G. S. Thakur	
2.	Members	Dr. Vijay Laxmi Naidu	
		Dr. Satish Kumar Sen	
		Dr. Shriram Kunjam	
		Mr. Motiram Sahu	
		Dr. Rajeshwari Prabha Lahare	
3.	Subject specialist	1. Prof. P.C. Panda Retd. Professor Borsi Durg C.G.)	
		2. Dr. N.B. Singh (Govt. N.PG. Science College Raipur C.G.)	
4.	VC Nominated member	Dr. Aruna Shrivastava (Govt. D.B. Girls PG College Raipur C.G.)	
5.	Corporate/ Industrial area Representative	Shri Manish Jain (Apollo College, Durg C.G.)	
6.	Ex Meritorious Student PG	Devika Janghel	
7.	Subject expert from other Department	Dr. Divya Minz (Department of Zoology, Govt. V.Y.T. PG. Autonomous College Durg C.G.)	

GOVT. V.Y.T.PG AUTONOMOUS COLLEGE, DURG (CG)
FOUR YEAR UNDERGRADUATE PROGRAM
DEPARTMENT OF BOTANY
COURSE CURRICULUM 2025-26

PART-A: Introduction			
Program: Undergraduate (Certificate / Diploma / Degree/Honors)		Semester - II/IV	Session 2025-26
1	Course Code	BOSEC-02	
2	Course Title	Flower Decoration	
3	Course Type	Skill Enhance Course (SEC)	
4	Pre-requisite (if, any)	As per Government norms / Institutional scheme	
5	Course Learning Outcomes(CLO)	<i>After completion of this course, the students will be able to-</i> ➤ -understand the concept of Flower arrangement & Decoration ➤ -learn the idea, design and style of Flower decoration and its importance ➤ -learn the skill of different types Flower arrangement with local/social application, commercial value and social demand ➤ -adopt the skill of Indian, Western, Japanese and other/local style of flower arrangement / decoration towards level of entrepreneurs' start-up	
6	Credit Value	2 Credits (1C + 1C)	Credit = 15 Hours – Theoretical learning and = 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 Teaching-learning Periods: Theory – 15 Periods (15 Hrs) and Lab. or Field learning/Training 30 Periods (30 Hours)		
Module	Topics (Course contents): learning, Observation and Preparation	No. of Hrs
I	Introduction: Basic knowledge of Flowering plants, Ornamental plants, Decorative plants- Shade plants, Ferns, Bonsai, Decorative Flowers, Flower shows. Commercial flowers, Common Ornamental plants and flowers of local area /state. Famous flower Gardens of India. <i>[Learning and Practices]</i>	04Hours Learning and 07 Hours Practices
II	Floral ornaments & Flower arrangements: Garlands, Floral bouquets, Floral rangoli, Flower arrangements – concept, idea , design and style – Western styles, Japanes or Ikebana styles, Common types of Flower arrangement – Elliptical, Vertical, Horizontal Triangular, Crescent, S & Oval shapes and Cascade .flower arrangement. <i>[Learning and Practices]</i>	04Hours Learning and 07HoursPractices
III	Flower decoration: Flowers used for decoration; Different idea of flower decoration for Home, Festivals, office, Gallery, Stage, Wall, Table, Gate. Flower Pot / Vas / Bottle decoration. <i>[Learning and Practices]</i>	03 Hours + 07 Hours
IV	Creative decorations: Flower drying and Dry flower decoration, Foliage arrangement; Dry foliage decoration; Flower decoration by Oil Painting, Resin art of Flower decoration Terrarium – concept, design and creation of different forms. Bonsai, Shady foliage, Fern and Water plant/ flower decoration. <i>[Learning and Practices]</i>	04Hours Learning and 09 Hours Practices
Keywords	Floral ornaments, Flower arrangement, Flower decoration	

PART-C**BOSEC-02 (Flower Decoration)****Learning Resources: Text Books, Reference Books and Others****Text Books Recommended****Textbooks:**

1. Floriculture in India, G. S. Randhawa and A. Mukhopadhyay, Allied Publishers Pvt. Ltd.
2. Modern Ikebana: A New Wave in Floral Design Hardcover-2020 by Tom Loxley & Victoria Gaiger
3. On Flowers: Lessons from an Accidental Florist, Illustrated, 2019 by Amy Merrick (Author)
4. Flower School: A Practical Guide to the Art of Flower Arranging, 2020 by Calvert Cray (Author)
5. The Flower Expert: Ideas and Inspiration for a Life With Flowers, 2019 by Fleur McHarg (Author)
6. The Art of Flower Arranging, 1992 by Jan Hall (Author)
7. A Personal Guide to Flower Arranging: Volume 2 Spring and Summer, 2021 by Wendy Markby
8. The Flower Chef: A Modern Guide to Do-It-Yourself Floral Arrangements, 2016 by Carly Cylinder
9. Easy Ikebana: 30 Beautiful Flower Arrangements, 2020 by Shinichi Nagatsuka (Author)

Reference Book:

<https://www.gardensillustrated.com/reviews/the-best-new-floristry-books>

Online Resources-

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

Use of following sites

- <https://en.wikipedia.org/wiki/Ikebana>
- <https://www.artsy.net/article/artsy-editorial-thriving-art-ikebana-japanese-tradition-flower-arranging>
- https://agritech.tnau.ac.in/horticulture/horti_Landscaping_dryflower_tech.html
- <https://library.ihbt.res.in/Institute%20Brochures/dry%20flower.pdf>
- https://static.vikaspedia.in/media/files_en/agriculture/farm-based-enterprises/value-added-products/dry-flower-production-1.pdf
- https://www.researchgate.net/publication/362645798_Dry_Flower_Technology_A_Value_Addition_to_Floriculture_Industry
- <https://in.pinterest.com/smsastry/flower-decoration/>
- <https://in.pinterest.com/galisreelatha/flower-decoration/>
- <https://www.britannica.com/art/floral-decoration>
- <https://homebnc.com/best-creative-flower-decoration-ideas/>

PART -D: Assessment and Evaluation**Suggested Continuous Evaluation Methods:**

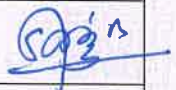
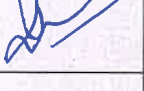
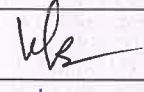
Maximum Marks: 50 Marks

Continuous Internal Assessment (CIA): 15 Marks

End Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): (By Course Coordinator)	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):	Laboratory / Field Skill Performance: On spot Assessment A. Performed the Task based on learned skill - 20 Marks B. Spotting based on tools (written) - 10 Marks C. Viva-voce (based on principle/technology) - 05 Marks	Managed by Coordinator as per skilling

Name & Signature of Members of Board of Studies

S. No.	Category	Name of Nominated Members	Signature
1.	Chairperson	Dr. G. S. Thakur	
2.	Members	Dr. Vijay Laxmi Naidu	
		Dr. Satish Kumar Sen	
		Dr. Shriram Kunjam	
		Mr. Motiram Sahu	
		Dr. Rajeshwari Prabha Lahare	
3.	Subject specialist	1. Prof. P.C. Panda Retd. Professor Borsi Durg C.G.)	
		2. Dr. N.B. Singh (Govt. N.PG. Science College Raipur C.G.)	
4.	VC Nominated member	Dr. Aruna Shrivastava (Govt. D.B. Girls PG College Raipur C.G.)	
5.	Corporate/ Industrial area Representative	Shri Manish Jain (Apollo Collee, Durg C.G.)	
6.	Ex Meritorious Student PG	Devika Janghel	
7.	Subject expert from other Department	Dr. Divya Minz (Department of Zoology, Govt. V.Y.T. PG. Autonomous College Durg C.G.)	