DEPARTMENT OF BOTANY

COURSE CURRICULUM & MARKING SCHEME

B.Sc. I & II Semester
BOTANY

(Based on Choice Based Credit System)

SESSION : 2022-23

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
(Chhattisgarh)
(Erstwhile: Govt. Arts & Science College, Durg)

Proposed Scheme For 4Yr UG Program in Botany

Semester	Core	Elective Discipline Specific	Generic Elective	Ability Enhancement Course	Skill Enhancement Course	Intership/ Project	Value Added	Total Credits
1	**CC1** Biodiversity (Microbes, Algae, Fungi, and Archegoniate) (6)			Choose 1 from pool of AEC Hindi Language+ English Language(4)	Choose 1 from pool of **SEC I** Medicinal Botany **SEC II** Mushroom Culture Technology			24
2	**CC2** Plant Ecology and Taxonomy (6)			Environment (2) Environment Project (2)	Choose 1 from pool of **SEC I** Medicinal Botany **SEC II** Mushroom Culture Technology			24
Students on exit shall be awarded undergraduate certificate (in the field of Multidisciplinary Study) after securing the requisite 48 credits in Semester 1 and 2								
3	**CC3** Plant Anatomy and Embryology (6)	Choose 1 from a pool of **GEC-I** Plant Diversity and Human Welfare/ **GEC-II** Ethnobotany			Choose 1 from pool of **SEC I** Medicinal Botany **SEC II** Mushroom Culture Technology			24
4	**CC 4** Plant Physiology and Metabolism (6)	Choose 1 from a pool of **GEC-I** Plant Diversity and Human Welfare/ **GEC-II** Ethnobotany			Choose 1 from pool of **SEC I** Medicinal Botany **SEC II** Mushroom Culture Technology			24

Students on exit shall be awarded undergraduate Diploma (in the field of Multidisciplinary Study) after securing the requisite 96 credits in Semester IV							
5	**CC5** Cell and Molecular Biology (6)		Choose 1 **GEC-I** Plant Diversity and Human Welfare/ **GEC-II** Ethnobotany		Choose 1 from pool of **SEC I** Medicinal Botany **SEC II** Mushroom Culture Technology		24
6	**CC6** Genetics (6)		Choose 1 **GEC-I** Plant Diversity and Human Welfare/ **GEC-II** Ethnobotany		Choose 1 from pool of **SEC I** Medicinal Botany **SEC II** Mushroom Culture Technology		24
Students on exit shall be awarded Bachelor of (in the field of Multidisciplinary Study) after securing the requisite credits in Semester VI 144							
7	**CC 7** Plant Biotechnology (6)	Choose 2 **DSE I-** Biomolecules **DSE II** Analytical Techniques in Plants **DSE III** Biostatistics (12)	Research Methodology (6)	-			24
8		Choose 2 **DSE I-** Natural Resource Management **DSE II-** Bioinformatics **DSE III-** Stress Biology (12)				Review/Project/ Dissertation (12)	24
Students on exit shall be awarded Bachelor of (in the field of Multidisciplinary Study)(Honours or Honours with Academic projects/Enterpruenership) after securing the requisite 192 credits in Semester VIII						**Total**	**192**

Coordinator

Name and Signatures of Members Board of Studies

S. No.	Category	Name of Nominated Members	Signature
1.	Chairperson	**Dr. Ranjana Shrivastava**	
2.	Members	1. Prof. Smt. Gayatri Pandey	
		2. Dr. G. S. Thakur	
		3. Dr. Shriram Kunjam	
		4. Dr. Satish Kumar Sen	
		5. Dr. Vijay Laxmi Naidu	
		6. Mr. Motiram Sahu	
		7. 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	Umashankar Gayakwad	
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

Syllabus and Marking Scheme for B.Sc. Semester- I&II

SESSION: 2022-2023

Course Code	Title of the Paper	Marks Allotted in Theory	
		Max	Min
Semester-I			
Course Code: BBOC-101	Biodiversity (Microbes, Algae, Fungi and Archegoniate)	50	17
Course Code: BBOL-01	Lab course	50	17
Skill Enhancement Course			
Course Code: BBOS-01	**SEC I:**Medicinal Botany	50	17
Course Code: BBOS-02	**SEC II:**Mushroom Culture Technology	50	17
Semester-II			
Course Code-BBOC-201	Plant Ecology and Taxonomy	50	17
Course Code- BBOL-02	Lab course	50	17
Skill Enhancement Course			
Course Code: BBOS-01	**SEC I:**Medicinal Botany	50	17
Course Code: BBOS-02	**SEC II:**Mushroom Culture Technology	50	17

GOVT. V.Y.T. PG. AUTONOMOUS COLLEGE DURG
Syllabus and Marking Scheme for B.Sc. Semester- I
SESSION: 2022-2023

Paper No.	Title of the Paper	Marks Allotted in Theory	
		Max	Min
I (Course Code- BBO01)	Biodiversity (Microbes, Algae, Fungi and Archegoniate)	50	17
II (Course Code- BBO02)	Plant Ecology and Taxonomy	50	17
III (Course Code- BBOP01)	Lab course/ Practical	50	17
	Total	**150**	

02 Theory papers - 100
01 Practical - 50
Total Marks - 150

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		6. Mr. Motiram Sahu	
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Govt. V.Y.T. PG Autonomous College, Durg (Chhattisgarh)
Department of Botany
2022-2023
B.Sc. Semester -I (CBCS)
Course Code: BBOC-101
Core Course: Biodiversity (Microbes, Algae, Fungi and Archegoniate)
(Credits: Theory-4, Practicals-2)
THEORY
Lectures: 60

Course Outcome

On completion of the course, students are able to:

CO 1: To define the microbes and explain structure and types of viruses and bacteria.

CO 2: To explain the reproduction and economic importance of viruses and bacteria.

CO 3: To discuss the general characters, distribution and range of thallus organization of algae.

CO 4: To describe the classification, Morphology, life cycle and economic importance of algae.

CO 5: State the diversity, general characters, classification and nutrition of Fungi, Lichen and Mycorrhiza.

CO 6: To describe life cycle and economic importance of fungi, lichen and mycorrhiza.

CO 7: To define Archegoniate and alternation of generation

CO 8: To discuss general characters, classifications, life cycle and economic importance of Bryophytes, Pteridophytes and Gymnosperm.

Unit 1: Microbes **(10 Lectures)**

Viruses – Discovery, general structure, replication (general account), DNA virus (T-phage); Lytic and lysogenic cycle, RNA virus (TMV); Economic importance;

Bacteria – Discovery, General characteristics and cell structure; Reproduction – vegetative, asexual and recombination (conjugation, transformation and transduction); Economic importance.

Unit 2: Algae **(12 Lectures)**

General characteristics; Ecology and distribution; Range of thallus organization and reproduction; Classification of algae; Morphology and life-cycles of the following: *Nostoc, Chlamydomonas, Oedogonium, Vaucheria, Ectocarpus, Polysiphonia*. Economic importance of algae.

Unit 3: Fungi **(12 Lectures)**

Introduction- General characteristics, ecology and significance, range of thallus organization, cell wall composition, nutrition, reproduction and classification; True Fungi- General characteristics, ecology and significance, life cycle of *Rhizopus* (Zygomycota) *Penicillium, Peziza*(Ascomycota), *Puccinia* (Basidiomycota)*Alternaria* (Deuteromycota); Symbiotic

Associations-Lichens: General account, reproduction and significance; Mycorrhiza: ectomycorrhiza and endomycorrhiza and their significance

Unit 4: Introduction to Archegoniate **(12 Lectures)**

Unifying features of archegoniates, Transition to land habit, Alternation of generations.

Bryophytes: General characteristics, adaptations to land habit, Classification, Range of thallus organization. Classification (up to family), morphology, anatomy and reproduction of *Marchantia* and *Funaria*. (**Developmental details not to be included**). Ecology and economic importance ofbryophytes.

Unit 5: Pteridophytes and Gymnosperms **(14 Lectures)**

Pteridophytes: General characteristics, classification, Early land plants (*Rhynia*). Classification (up to family), morphology, anatomy and reproduction of *Selaginella*and *Equisetum*. **(Developmental details not to be included**). Heterospory and seed habit, stelar evolution. Ecological and economical importance of Pteridophytes.

Gymnosperms: General characteristics, classification. Classification (up to family), morphology, anatomy and reproduction of *Cycas* and *Pinus*. (Developmental details not to be included). Ecological and economical importance.

Suggested Readings

1. Kumar, H.D. (1999). Introductory Phycology. Affiliated East-West. Press Pvt. Ltd. Delhi. 2nd edition.
2. Tortora, G.J., Funke, B.R., Case, C.L. (2010). Microbiology: An Introduction, Pearson Benjamin Cummings, U.S.A. 10th edition.
3. Sethi, I.K. and Walia, S.K. (2011). Text book of Fungi & Their Allies, MacMillan Publishers Pvt. Ltd., Delhi.
4. Alexopoulos, C.J., Mims, C.W., Blackwell, M. (1996). Introductory Mycology, John Wiley and Sons (Asia), Singapore. 4th edition.
5. Raven, P.H., Johnson, G.B., Losos, J.B., Singer, S.R., (2005). Biology. Tata McGraw Hill, Delhi, India.
6. Vashishta, P.C., Sinha, A.K., Kumar, A., (2010). Pteridophyta, S. Chand. Delhi, India.
7. Bhatnagar, S.P. and Moitra, A. (1996). Gymnosperms. New Age International (P) Ltd Publishers, New Delhi, India.
8. Parihar, N.S. (1991). An introduction to Embryophytes. Vol. I. Bryophyta. Central Book Depot, Allahabad.

Govt. V.Y.T. PG Autonomous College, Durg (Chhattisgarh)
Department of Botany
2022-2023
B.Sc. Semester -I (CBCS)
Course Code: BBOL-01
Core Course: Lab Course
(Based on Biodiversity (Microbes, Algae, Fungi and Archegoniate))

List of Experiments

1. EMs/Models of viruses – T-Phage and TMV, Line drawing/Photograph of Lytic and Lysogenic Cycle.
2. Types of Bacteria from temporary/permanent slides/photographs; EM bacterium; Binary Fission; Conjugation; Structure of root nodule.
3. Gram staining
4. Study of vegetative and reproductive structures of Nostoc, Chlamydomonas (electron micrographs), Oedogonium, Vaucheria, Ectocarpus* and Polysiphonia through temporary preparations and permanent slides. (* Ectocarpus - Specimen and permanent slides)
5. *Rhizopus* and *Penicillium*: Asexual stage from temporary mounts and sexual structures through permanent slides.
6. Alternaria: Specimens/photographs and tease mounts.
7. *Puccinia*: Herbarium specimens of Black Stem Rust of Wheat and infected Barberryleaves; section/tease mounts of spores on Wheat and permanent slides of both the hosts.
8. *Agaricus*: Specimens of button stage and full-grown mushroom; Sectioning of gills ofAgaricus.
9. *Lichens*: Study of growth forms of lichens (crustose, foliose and fruticose)
10. *Mycorrhiza*: Ecto mycorrhiza and endo mycorrhiza (Photographs)
11. *Marchantia*- morphology of thallus, W.M. rhizoids and scales, V.S. thallus throughgemma cup, W.M. gemmae (all temporary slides), V.S. antheridiophore, archegoniophore,L.S. sporophyte (all permanent slides).
12. *Funaria*- morphology, W.M. leaf, rhizoids, operculum, peristome, annulus, spores(temporary slides); permanent slides showing antheridial and archegonial heads, L.S. capsule and protonema.
13. *Selaginella*- morphology, W.M. leaf with ligule, T.S. stem, W.M. strobilus, W.M.microsporophyll and megasporophyll (temporary slides), L.S. strobilus (permanent slide).

14. *Equisetum*- morphology, T.S. internode, L.S. strobilus, T.S. strobilus, W.M. sporangiophore,W.M. spores (wet and dry) (temporary slides); T.S rhizome (permanent slide).
15. *Cycas*- morphology (coralloid roots, bulbil, leaf), T.S. coralloid root, T.S. rachis, V.S. leaflet,V.S. microsporophyll, W.M. spores (temporary slides), L.S. ovule, T.S. root (permanent slide).
16. *Pinus*- morphology (long and dwarf shoots, W.M. dwarf shoot, male and female), W.M. dwarf shoot, T.S. needle, T.S. stem, L.S./T.S. male cone, W.M. microsporophyll, W.M. microspores (temporary slides), L.S. female cone, T.L.S. &R.L.S. stem (permanent slide).

Practical Scheme

Time: 3Hrs	**M.M. 50**
1. Microbiology/Algae	08
2. Fungi/Bryophytes	08
3. Pteridophytes/Gymnosperm	10
4. Spotting (1-5)	10
5. Project/Field work	04
5. Viva-voce	05
6. Sessional	05

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6.	Ex Meritorious Student PG	Umashankar Gayakwad	
7.	Subject expert from other Department	Dr. Divya Minz (Department of Zoology, Govt. V.Y.T. PG. Autonomous College Durg C.G.)	

Question Paper Format and Distribution of Marks for Under Graduate Examination

1. The question paper for UG Classes is to be divided into three Sections - A, B & C.
2. Section A shall contain very short answer type questions (answer in one or two sentences) or objective type questions. (No Multiple choice questions. No 'fill in the blank' type Questions)
3. Section B shall contain short answer type questions with the limit of 150 words.
4. Section C shall contain long answer/descriptive type questions. The students are required to answer precisely and the answer should not exceed the limit of 350 words.
5. The scheme of marks should be as follows:

Question Type	MM 50 (Marks x No. of Questions)
A (Very short Answer)	1x10 = 10
B (Short Answer)	3x5 = 15
C (Long Answer)	5x5 = 25

The half yearly internal examinations will be held. 10% out of marks obtained by the students in each paper in internal examinations will be added to 90% of marks obtained in each paper of annual examination.

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Govt. V.Y.T. PG Autonomous College, Durg (Chhattisgarh)
Department of Botany
2022-2023
B.Sc. Semester -II (CBCS)
Course Code-BBOC-201
Core Course: Plant Ecology and Taxonomy
(Credits: Theory-4, Practicals-2)
THEORY
Lectures: 60

Course Outcome

On completion of the course, students are able to:

CO 1: To define the plant ecology and describe various ecological factors in living system.

CO 2: To understand about the inter relationship between living world and environment.

CO 3: To understand about the fundamental aspect of ecosystem and phytogeography.

CO 4: To define taxonomy and types of classification systems.

CO 5: To describe general taxonomic rule on plant classification.

CO 6: To understand about the process of plant description and identification.

Unit 1: Introduction of plant ecology **(12 Lectures)**

Ecological factors: Soil: -Origin, formation, composition, soil profile. **Water**: States of water in the environment, precipitation types. **Light and temperature**: Variation Optimal and limiting factors; Shelfordlaw of tolerance. Adaptation of hydrophytes and xerophytes.

Unit 2: Plant communities and Ecosystem **(12Lectures)**

Characters; Ecotone and edge effect; Succession: Processes and types.

Ecosystem: Structure; energy flow trophic organisation; Food chains and food webs. Ecological pyramids production and productivity; Biogeochemical cycling; Cycling of carbon, nitrogen and

Phosphorous

Phytogeography: Principle biogeographical zones; Endemism

Unit3: Introduction to plant taxonomy **(14 Lectures)**

Taxonomic hierarchy: Ranks, categories and taxonomic groups

Botanical nomenclature: Principles and rules (ICN); ranks and names; binominal system, typification, author citation, valid publication, rejection of names, principle of priority and its limitations.

Herbarium techniques, important herbaria and botanical gardens of the world and India: Documentation: Flora, Keys: single access and multi-access. Taxonomic evidences from cytology and phytochemistry.

Unit 4: System of Classification and Numerical taxonomy (10 Lectures)

Types of classification-Artificial, natural and Phylogenetic. Bentham and Hooker (upto series), Engler and Prantl (up to series).

Biometrics, numerical taxonomy and cladistics: Characters: variations: OTUs, character weighting and coding; cluster analysis; phenograms, cladograms (definitions and differences).

Unit 5: Systematic study of taxonomic plants (12 Lectures)

Study of vegetative and floral characters of the following families:Brassicaceae,Malvaceae,Asteraceae,Apocynaceae,Solanaceae, Lamiaceae and Liliaceae.

Suggested Readings

1. Kormondy, E.J. (1996). Concepts of Ecology. Prentice Hall, U.S.A. 4th edition.
2. Sharma, P.D. (2010) Ecology and Environment. Rastogi Publications, Meerut, India. 8th edition.
3. Simpson, M.G. (2006). Plant Systematics. Elsevier Academic Press, San Diego, CA, U.S.A.
4. Singh, G. (2012). Plant Systematics: Theory and Practice. Oxford & IBH Pvt. Ltd., New Delhi. 3rd edition.

Govt. V.Y.T. PG Autonomous College, Durg (Chhattisgarh)
Department of Botany
2022-2023
B.Sc. Semester -II (CBCS)
Course Code: BBOL-02
Core Course: Lab Course
(Based on Plant Ecology and Taxonomy)

List of Experiments

1. Study of instruments used to measure microclimatic variables: Soil thermometer, maximum and minimum thermometer, anemometer, psychrometer/hygrometer, rain gauge and lux meter.
2. Determination of pH, and analysis of two soil samples for carbonates, chlorides, nitrates, sulphates, organic matter and base deficiency by rapid field test.
3. Comparison of bulk density, porosity and rate of infiltration of water in soil of three habitats.
4. (a) Study of morphological adaptations of hydrophytes and xerophytes (four each). (b)Study
   of biotic interactions of the following: Stem parasite (*Cuscuta*), Root parasite (Orobanche), Epiphytes, Predation (Insectivorous plants)
5. Determination of minimal quadrate size for the study of herbaceous vegetation in the college campus by species area curve method. (Species to be listed)
6. Quantitative analysis of herbaceous vegetation in the college campus for frequency and comparison with Raunkiaer's frequency distribution law.
7. Study of vegetative and floral characters of the following families (Description, V.S. flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hooker's system of classification): Brassicaceae-*Brassica, Alyssum/Iberis*;Malvaceae-*Hibiscus-rosa-sinensis*, Asteraceae *Sonchus/Launaea/Vernonia/Ageratum, Eclipta/Tridax*; Apocynaceae-*Thevetia*, Solanaceae *-Datura/Withania*; Lamiaceae -*Salvia/ Ocimum*; Liliaceae - *Asphodelus / Lilium / Allium.*
8. Mounting of a properly dried and pressed specimen of any wild plant with herbarium label (to be submitted in the record book).

Practical Scheme

Time: 3Hrs	**M.M. 50**
1. Morphological and Anatomical adaptations / Soil Test	06
2. Quantitative analysis of plants	10
3. Plant Description	10
4. Spotting (1-5)	10
5. Project/Field work	04
6. Viva-voce	05
7. Sessional	05

Question Paper Format and Distribution of Marks for Under Graduate Examination

6. The question paper for UG Classes is to be divided into three Sections - A, B & C.
7. Section A shall contain very short answer type questions (answer in one or two sentences) or objective type questions. (No Multiple choice questions. No 'fill in the blank' type Questions)
8. Section B shall contain short answer type questions with the limit of 150 words.
9. Section C shall contain long answer/descriptive type questions. The students are required to answer precisely and the answer should not exceed the limit of 350 words.
10. The scheme of marks should be as follows:

Question Type	MM 50 (Marks x No. of Questions)
A (Very short Answer)	1x10 = 10
B (Short Answer)	3x5 = 15
C (Long Answer)	5x5 = 25

The half yearly internal examinations will be held. 10% out of marks obtained by the students in each paper in internal examinations will be added to 90% of marks obtained in each paper of annual examination.

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Govt. V.Y.T. PG Autonomous College, Durg (Chhattisgarh)
Department of Botany
2022-2023
B.Sc. Semester -II (CBCS)
(Course Code- BBO02)
Core Course: Plant Ecology and Taxonomy
(Credits: Theory-4, Practicals-2)
THEORY
Lectures: 60

Course Outcome

On completion of the course, students are able to:

CO 1: To define the plant ecology and describe various ecological factors in living system.

CO 2: To understand about the inter relationship between living world and environment.

CO 3: To understand about the fundamental aspect of ecosystem and phytogeography.

CO 4: To define taxonomy and types of classification systems.

CO 5: To describe general taxonomic rule on plant classification.

CO 6: To understand about the process of plant description and identification.

Unit 1: Introduction of plant ecology **(12 Lectures)**

Ecological factors: Soil: -Origin, formation, composition, soil profile. **Water**: States of water in the environment, precipitation types. **Light and temperature**: Variation Optimal and limiting factors; Shelfordlaw of tolerance. Adaptation of hydrophytes and xerophytes.

Unit 2: Plant communities and Ecosystem **(12Lectures)**

Characters; Ecotone and edge effect; Succession; Processes and types.

Ecosystem: Structure; energy flow trophic organisation; Food chains and food webs, Ecological pyramids production and productivity; Biogeochemical cycling; Cycling of carbon, nitrogen and

Phosphorous

Phytogeography: Principle biogeographical zones; Endemism

Unit3: Introduction to plant taxonomy **(14 Lectures)**

Taxonomic hierarchy: Ranks, categories and taxonomic groups

Botanical nomenclature: Principles and rules (ICN); ranks and names; binominal system, typification, author citation, valid publication, rejection of names, principle of priority and its limitations.

Herbarium techniques, important herbaria and botanical gardens of the world and India; Documentation: Flora, Keys: single access and multi-access,Taxonomic evidences from cytology and phytochemistry.

Unit 4: System of Classification and Numerical taxonomy (10 Lectures)

Types of classification-artificial, natural and phylogenetic. Bentham and Hooker (upto series), Engler and Prantl (up to series).

Biometrics, numerical taxonomy and cladistics: Characters; variations; OTUs, character weighting and coding; cluster analysis; phenograms, cladograms (definitions and differences).

Unit 5: Systematic study of taxonomic plants (12 Lectures)

Study of vegetative and floral characters of the following families:Brassicaceae,Malvaceae,Asteraceae,Apocynaceae,Solanaceae, Lamiaceae and Liliaceae.

Practical

1. Study of instruments used to measure microclimatic variables: Soil thermometer, maximum and minimum thermometer, anemometer, psychrometer/hygrometer, rain gauge and lux meter.
2. Determination of pH, and analysis of two soil samples for carbonates, chlorides, nitrates, sulphates, organic matter and base deficiency by rapid field test.
3. Comparison of bulk density, porosity and rate of infiltration of water in soil of three habitats.
4. (a) Study of morphological adaptations of hydrophytes and xerophytes (four each). (b)Study
   of biotic interactions of the following: Stem parasite (*Cuscuta*), Root parasite (Orobanche), Epiphytes, Predation (Insectivorous plants)
5. Determination of minimal quadrat size for the study of herbaceous vegetation in the college
   campus by species area curve method. (Species to be listed)
6. Quantitative analysis of herbaceous vegetation in the college campus for frequency and comparison with Raunkiaer's frequency distribution law.
7. Study of vegetative and floral characters of the following families (Description, V.S. flower,
   section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hooker's system of classification): Brassicaceae -*Brassica, Alyssum / Iberis*;Malvaceae- Hibiscus-rosa-sinensis, Asteraceae -

Sonchus/Launaea/Vernonia/Ageratum, Eclipta/Tridax; Apocynaceae-*Thevetia*, Solanaceae -*Datura/Withania*; Lamiaceae -*Salvia/ Ocimum*; Liliaceae - *Asphodelus / Lilium / Allium*.

8. Mounting of a properly dried and pressed specimen of any wild plant with herbarium label (to be submitted in the record book).

Suggested Readings

1. Kormondy, E.J. (1996). Concepts of Ecology. Prentice Hall, U.S.A. 4th edition.
2. Sharma, P.D. (2010) Ecology and Environment. Rastogi Publications, Meerut, India. 8th edition.
3. Simpson, M.G. (2006). Plant Systematics. Elsevier Academic Press, San Diego, CA, U.S.A.
4. Singh, G. (2012). Plant Systematics: Theory and Practice. Oxford & IBH Pvt. Ltd., New Delhi. 3rd edition.

Practical Scheme

Time: 3Hrs	**M.M. 50**
1. Morphological and Anatomical adaptations / Soil Test	06
2. Quantitative analysis of plants	10
3. Plant Description	10
4. Spotting (1-5)	10
5. Project/Field work	04
6. Viva-voce	05
7. Sessional	05

Question Paper Format and Distribution of Marks for Under Graduate Examination

6. The question paper for UG Classes is to be divided into three Sections - A, B & C.
7. Section A shall contain very short answer type questions (answer in one or two sentences) or objective type questions. (No Multiple choice questions. No 'fill in the blank' type Questions)
8. Section B shall contain short answer type questions with the limit of 150 words.
9. Section C shall contain long answer/descriptive type questions. The students are required to answer precisely and the answer should not exceed the limit of 350 words.
10. The scheme of marks should be as follows:

Question Type	MM 50 (Marks x No. of Questions)
A (Very short Answer)	1x10 = 10
B (Short Answer)	3x5 = 15
C (Long Answer)	5x5 = 25

The half yearly internal examinations will be held. 10% out of marks obtained by the students in each paper in internal examinations will be added to 90% of marks obtained in each paper of annual examination.

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1.	Chairperson	**Dr. Ranjana Shrivastava**	
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Govt. V.Y.T. PG Autonomous College, Durg (Chhattisgarh)
Department of Botany
2022-2023
B.Sc. Semester -I&II (CBCS)
Skill Enhancement Course (SEC)
Course Code: BBOS-02
Mushroom Culture Technology
(Credits 2)
Lectures: 30

Unit 1: Introduction, history. Nutritional and medicinal value of edible mushrooms; Poisonousmushrooms.Types of edible mushrooms available in India - *Volvariellavolvacea*, *Pleurotus citrinopileatus*, *Agaricus bisporus*.

(5 Lectures)

Unit 2:CultivationTechnology: Infrastructure: substrates (locally available) Polythene bag, vessels, Inoculation hook, inoculation loop, low-cost stove, sieves, culture rack, mushroom unit (Thatched house) water sprayer, tray, small polythene bag. **(6 Lectures)**

Unit 3: **Pure culture Techniques:** Medium,sterilization, preparation of spawn, multiplication. Mushroom bed preparation - paddy straw, sugarcane trash, maize straw, banana leaves. Factors affecting the mushroom bed preparation - Low-cost technology, Composting technology in mushroom production. **(6 Lectures)**

Unit 4: Storage and nutrition: Short-term storage (Refrigeration - upto 24 hours) Long termStorage (canning, pickles, papads), drying, storage in saltsolutions. Nutrition - Proteins - amino acids, mineral elements nutrition - Carbohydrates, Crude fibre content - Vitamins. **(8 Lectures)**

Unit 5: Food Preparation: Types of foods prepared from mushroom.Research Centres - National level and regional level.Cost benefit ratio - Marketing in India and abroad, Export Value. **(5 lectures)**

Suggested Readings

1. Marimuthu, T. Krishnamoorthy, A.S. Sivaprakasam, K. and Jayarajan, R (1991)
2. Oyster Mushrooms, Department of Plant Pathology, Tamil Nadu Agricultural University, Coimbatore.
3. Swaminathan, M. (1990) Food and Nutrition. Bappco, The Bangalore Printing and Publishing Co. Ltd., No. 88, Mysore Road, Bangalore - 560018.
4. Tewari, Pankaj Kapoor, S.C., (1988). Mushroom cultivation, Mittal Publications, Delhi.
5. Nita Bahl (1984-1988) Hand book of Mushrooms, II Edition, Vol. I & Vol. II.

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Govt. V.Y.T. PG Autonomous College, Durg (Chhattisgarh)
Department of Botany
2022-2023
B.Sc. Semester -I&II (CBCS)
Skill Enhancement Course (SEC)
Course Code: BBOS-01
Medicinal Botany
(Credits 2)
Lectures: 30

Unit 1: History, Scope and Importance of Medicinal Plants. 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: Umoor-e- tabiya, tumors treatments/ therapy, polyherbal formulations. **(10 Lectures)**

Unit 2: Conservation of endangered and endemic medicinal plants. Definition: endemic and endangered medicinal plants, Red list criteria; In situ conservation: Biosphere reserves, sacred groves, National Parks; Ex situ conservation: Botanic Gardens, Ethnomedicinal plant Gardens.

(05 Lectures)

Unit 3: Propagation of Medicinal Plants: Objectives of the nursery, its classification, important components of a nursery, sowing, pricking, use of green house for nursery production, propagation through cuttings, layering, grafting and budding. **(05 Lectures)**

Unit 4: Ethnobotany: Definition; Ethnobotany in India: Methods to study ethnobotany; Applications of Ethnobotany: National interacts, Paleo-ethnobotany. **(05 Lectures)**

Unit 5: Folk medicines: Folk medicines of ethnobotany, ethnomedicine, ethnoecology, ethnic communities of India. Application of natural products to certain diseases- Jaundice, cardiac, infertility, diabetics, Blood pressure and skin diseases. **(05 Lectures)**

Suggested Readings

1. Trivedi P C, 2006. Medicinal Plants: Ethnobotanical Approach, Agrobios, India.
2. Purohit and Vyas, 2008. Medicinal Plant Cultivation: A Scientific Approach, 2nd edn.- Agrobios, India.

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