SYLLABI AND SCHEME OF EXAMINATIONS FOR MULTIDISCIPLINARY COURSES FOR UNDER GRADUATE PROGRAM OFFERED BY DEPARTMENT OF BOTANY

Bachelor of Science (Life Sciences) Program

(Based on Curriculum and Credit Framework for UG Programs under NEP 2020)

WITH EFFECT FROM THE SESSION 2024-25

MAHARSHI DAYANAND UNIVERSITY ROHTAK (HARYANA)

SCHEME OF EXAMINATION FOR MULTIDISCIPLINARY COURSES FOR UNDER GRADUATE PROGRAM FOR B. Sc. (LIFE SCIENCE) OFFERED BY DEPT. OF BOTANY

Name of the Department	Nomenclature of Multidisciplinary Course (MDC) @ 3 credits	Course Code	Credits Distribution			Total Credits	Workload			Total Workload	Marks				Total Marks
			L	T	P		L	T	P		Theory		Practical		
											Internal	External	Internal	External	
Semester I (Session 2024-25)															
BOTANY	Organic Farming	24BOTX401MD01	2	0	1	3	2	0	2	4	15	35	5	20	75
Semester I (Session 2024-25)															
BOTANY	Plants Diversity & Human Welfare	24BOTX402MD01	2	0	1	3	2	0	2	4	15	35	5	20	75
Semester I (Session 2025-26)															
BOTANY	Plants in everyday life	25BOTX403MD01	2	0	1	3	2	0	2	4	15	35	5	20	75

L: Lecture; T: Tutorial; P: Practical

Note:

A student has to opt for three Multidisciplinary Courses in first three semester from the pool of the courses offered in the disciplines other than those of Major disciplines and Minor disciplines and the one not studied at 10+2 or equivalent level.

SYLLABI FOR MULTIDISCIPLINARY COURSES FOR B.Sc. (LIFE SCIENCE) OFFERED BY DEPT. OF BOTANY

Semester –I (Session: 2024-25)

Name of Program	**Bachelor of Science (Life Sciences)**	**Program Code**	**UMLS4**
Paper No.	**Paper 4 (Theory)**	**Nomenclature**	**Organic Farming**
Name of the Course	**Multidisciplinary (MDC-1)**	**Course Code**	**24BOTX401MD01**
Hours per Week	**02**	**Maximum Marks**	**50**
Credits	**02**	**Internal marks**	**15**
Time of Examinations	**03**	**External marks**	**35**

Note:
Examiner will set nine (09) questions and the candidates will be required to attempt five questions in all. Question number one (01) will be compulsory containing short answer type questions covering the entire syllabus from all units. Further, examiner will set two (02) questions from each unit and the candidates will be required to attempt one question from each Unit. All questions will carry equal marks.

Course Objectives:
To study the concept of organic farming ,plant nutrients importance and formation of organic products

Course Learning Outcomes (CLO): After completing this course, the learner will be able to:

CLO1 Students will be able to understand the need and concept of organic and integrated farming system.

CLO 2 Students will develop a conceptual understanding of plant nutrients, utilization of biofertilizers.

CLO 3 Students will gain knowledge about the disease and pest management

CLO 4 Students will learn about the use of plant products in organic farming, quality control and certification procedures of organic products.

Unit 1

Basics of organic farming: Concept and components of organic farming, aims and objectives; Need of organic farming; Historical development of organic farming in India; Status of organic farming in India; Advantages and disadvantages of organic farming. Organic farming process- Concept of farming system, Developing organic farms, Important steps & methods; Pure organic farming and integrated farming system (combination of organic and inorganic).

Unit 2

Plant nutrients: Essential plant nutrients, their role in plant growth and development, Nutrient uptake and ilization by plant. Nutrient management in organic farming: Balanced nutrients supply for organic farming ystem using nutrients from organic sources. Preparation, nutrient content and methods of use of following- YM/Rural compost, mulching, city compost, oil cakes, animal wastes, vermicomposts, vermiwash, evamrit, beejamrit, green manures, biofertilizers.

Unit 3

Biofertilizers and their method of use: Nitrogenous, Phosphatic, Potassic, availability of nutrients from above sources. Recycling of organic matter in organic agriculture-Transformation of organic substances in soil.

Disease and pest management in organic farming-Integrated pest & disease managements; Organic pesticides, bio-pesticides; Inorganic pesticides, disadvantages of their use; Seed, seedling and soil treatment measures; Feasibility of complete dependence on organic sources.Weed management in organic farming

Unit 4

Use of Neem and other plant products in organic farming; Organic agri- horticulture in urban & semi urban areas.

Certification, Standardization, Marketing - Quality control and certification procedures of organic products. Organic standards In India. Govt. schemes related to organic farming in India. Potential demand and Marketing of organic products. Organic farming and food security in India.

Semester –I (Session: 2024-25)

Name of Program	**Bachelor of Science (Life Sciences)**	**Program Code**	**UMLS4**
Paper No.	**Paper 4 (Practical)**	**Nomenclature**	**Organic Farming**
Name of the Course	**Multidisciplinary (MDC-1)**	**Course Code**	**24BOTX401MD01**
Hours per Week	**04**	**Maximum Marks**	**50**
Credits	**02**	**Internal marks**	**15**
Time of Examinations	**03**	**External marks**	**35**
Note:			

Course Objectives:
To study the concept of organic farming ,plant nutrients importance and formation of organic products

Course Learning Outcomes (CLO): After completing this course, the learner will be able to:

CLO1 Students will be able to understand the need and concept of organic and integrated farming system.

CLO 2 Students will develop a conceptual understanding of plant nutrients, utilization of biofertilizers.

CLO 3 Students will gain knowledge about the disease and pest management

CLO 4 Students will learn about the use of plant products in organic farming, quality control and certification procedures of organic products.

List of Practical:

1. Preparation of compost by open air composting.
2. Preparation of vermicompost.
3. Comparative analysis of plants grown in compost prepared in 1 and 2.
4. Determining the effectiveness of neem extract in pest control. Comparative analysis of plants grown in the presence of organic and inorganic fertilizers.
5. Comparative analysis of nitrogen content in organic and inorganic fertilizers.
6. Comparative analysis of phosphorous content in organic and inorganic fertilizers.
7. Isolation and study of microbes involve in decomposition of organic matter.

8. To study the effects of biofertilzers and compost on improvement of physical properties of soil.
9. To study the deficiency symptoms of different mineral nutrients in plants.

Pattern of Practical examination

1. One experiment/ task from list of experiments (5)
2. Submission of project report on topic allotted to student (10)
3. Practical records (3)
4. Viva-voce (2)

References/Suggested readings:

1. Chandran, S., Unni M.R., Thomas, S. Meena, D.K. 2023. Organic Farming: Global Perspectives and Methods. Elsevier.
2. Somasundaram, E. Udhaya Nandhini, D., Meyyappan, M. 2021. Principles of Organic Farming. CRC Press.
3. Chandran, S., Thomas, S., Unni M.R. 2019. Organic Farming: New Advances towards Sustainable Agricultural Systems. Springer.
4. Giri b, Prasad, R. Qiang-Sheng, W. & Varma A. 2019. Biofertilizers for sustainable agriculture and environment (Soil Biology Book 55). Springer.
5. Chandran, S., Unni M.R., Thomas, S. 2018. Organic Farming: Global Perspectives and Methods.Elsevier.
6. Subbarao, N.S. 2017. Bio-fertilizers in Agriculture and Forestry. Med Tech Publishers. 4th edition.
7. Hermary, H. 2007. Working with nature. Gaia College Inc.

Semester –II (Session: 2024-25)

Name of Program	**Bachelor of Science (Life Sciences)**	**Program Code**	**UMLS4**
Paper No.	**Paper 3 (Theory)**	**Nomenclature**	**Plant Diversity and Human Welfare**
Name of the Course	**Multidisciplinary Course (MDC 2)**	**Course Code**	**24BOTX402MD01**
Hours per Week	**02**	**Maximum Marks**	**50**
Credits	**02**	**Internal marks**	**15**
Time of Examinations	**03**	**External marks**	**35**

Note:

Examiner will set nine (09) questions and the candidates will be required to attempt five questions in all. Question number one (01) will be compulsory containing short answer type questions covering the entire syllabus from all units. Further, examiner will set two (02) questions from each unit and the candidates will be required to attempt one question from each Unit. All questions will carry equal marks.

Course Objectives:

To appreciate the value of biodiversity, function and role and methods of biodiversity conservation

Course Learning Outcomes (CLO):

On completion of this course, the students will gain knowledge and able to:

CLO 1: Judge the value of biodiversity

CLO 2: Understand the role of biodiversity in stabilizing the climate and economy

CLO 3: Know the causes and consequences of loss of biodiversity and planning of conservation strategies

CLO 4: To Know the role of plants in human welfare

Unit 1

Introduction: Types of Biodiversity; Level of Biodiversity: genetic, species and ecosystem; Patterns of biodiversity; Loss of genetic diversity, Loss of species diversity, Loss of ecosystem diversity, Loss of agrobiodiversity, Projected scenario for biodiversity loss; Factors affecting biodiversity: over exploitation, habitat loss and degradation, invasive species, disease, natural calamities, global climate change. Concept of endemism in plants

Unit 2

IUCN categories: not evaluated; data deficient; least concern; near threatened, vulnerable, endangered, critically endangered, extinct in wild; extinct categories. Principles of conservation; *In situ* and *ex situ* conservation, Social approaches to conservation, Biodiversity awareness programmes, Sustainable development.

Unit 3

Organizations associated with biodiversity management-Methodology for execution-IUCN, UNEP, UNESCO, WWF, NBPGR; Biodiversity legislation and conservations. Soil erosion and conservation methods. Conservation of Forests: Afforestation, Reforestation, Monoculture and their effects. Conservation of water: water scarcity, rain water harvesting. World Biodiversity hotspots; National Park, Biosphere reserves and Wetlands.

Unit 4

Role of plants in relation to Human Welfare; a) Importance of forestry their utilization and commercial aspects b) Avenue trees, c) Ornamental plants of India. d) Non-alcoholic beverages through ages. Fruits and nuts: Important fruit crops their commercial importance. Wood and its uses.

Semester –II (Session: 2024-25)

Name of Program	**Bachelor of Science (Life Sciences)**	**Program Code**	**UMLS4**
Paper No.	**Paper 3 (Practical)**	**Nomenclature**	**Plant Diversity and Human Welfare**
Name of the Course	**Multidisciplinary Course (MDC 2)**	**Course Code**	**24BOTX402MD01**
Hours per Week	**04**	**Maximum Marks**	**50**
Credits	**02**	**Internal marks**	**15**
Time of Examinations	**03**	**External marks**	**35**

Note:

Course Objectives: To appreciate the value of biodiversity, function and role and methods of biodiversity conservation

Course Learning Outcomes (CLO):

On completion of this course, the students will gain knowledge and able to:

CLO 1: Judge the value of biodiversity

CLO 2: Understand the role of biodiversity in stabilizing the climate and economy

CLO 3: Know the causes and consequences of loss of biodiversity and planning of conservation strategies

CLO 4: To Know the role of plants in human welfare

List of Practical:

1. Mapping species diversity
2. Mapping of crop diversity
3. Visits of plant conservatories
4. Study of wood features
5. Herbarium study of a) Avenue trees, b) Ornamental plants, c) Fruits and nuts, d) Timber plants
6. Procedure of *ex situ* conservation methods
7. Procedure of *in situ* conservation methods
8. Plantation of a tree in your locality/ field

Pattern of Practical Examination

1. Identify plant/plant part A & B and write a brief note on its economic importance(4)
2. Submission of project report on topic allotted to student (7)
3. Submission of proof (Soft/ hard copy) of tree plantation in field or your locality (4)
4. Practical records (3)
5. Viva-voce (2)

References/Suggested readings:

1. Krishnamurthy, K.V. (2004). An Advanced Text Book of Biodiversity - Principles and Practices. New Delhi, Delhi: Oxford and IBH Publications Co. Pvt. Ltd.
2. Samit Ray and Arun K. Ray (2012). Biodiversity and Biotechnology. New Central Book Agency) Ltd. London. Hyderabad, Delhi, Kolkata, Pune, Guwaha