SIDO KANHU MURMU UNIVERSITY, DUMKA

(A State University recognized under Section 2(f) & 12(B) of the UGC Act, 1956)

ASSOCIATED VOCATIONAL & ELECTIVE COURSE SYLLABUS

OF

MUSHROOM CULTIVATION

FOR SCIENCE STREAM STUDENTS

In accordance with the
Implementation of FYUGP in State Universities of
Jharkhand Regulations, 2024

Implemented from
Academic Session 2025-2029 Onwards

Board of Studies Committee Meeting Proceedings

A meeting of the Board of Studies Committee for the revision and finalization of the MUSHROOM CULTIVATION (ASSOCIATED VOCATIONAL & ELECTIVE COURSE) syllabus for the Four-Year Undergraduate Programme (FYUGP), in accordance with the Implementation of FYUGP in State Universities of Jharkhand Regulations, 2024, was convened on **10.10.2025** in hybrid mode.

The following members of the Board of Studies Committee were present in this meeting. The committee unanimously accepted and recommended the syllabi, incorporating major modifications.

Members of the Syllabus Committee:

S. N.	MEMBERS	SIGNATURE
1.	**Prof. (Dr.) Jyoti Kumar (External Expert)** Retd. University Professor University Department of Botany Ranchi University, Ranchi	Joined online
2.	**Dr. Sanjay Kumar Singh (Dean, Science)** Associate Professor, University Department of Chemistry Sido Kanhu Murmu University, Dumka	10/10/25
3.	**Dr. Sanjay Kumar Sinha (Member)** Associate Professor, University Department of Botany Sido Kanhu Murmu University, Dumka	10/10/25
4.	**Dr. Baskey Neeraj (Member)** Assistant Professor, University Department of Botany Sido Kanhu Murmu University, Dumka	10/10/25
5.	**Dr. Anita Chakraborty (Member)** Assistant Professor, University Department of Botany Sido Kanhu Murmu Uuniversity, Dumka	10/10/25
6.	**Dr. Amar Das (Member)** Assistant Professor, Botany & Prof. In-Charge, Degree College, Nala (Fathepur) Sido Kanhu Murmu University, Dumka	10/10/25
7.	**Dr. Samuel Kisku (Member)** Assistant Professor & Head, Department of Botany S.P. College, Dumka , Sido Kanhu Murmu University, Dumka	10/10/25
8.	**Dr. Ipsita Nandi (Member)** Assistant Professor, Department of Botany Deoghar College, Deoghar, Sido Kanhu Murmu University, Dumka	10/10/25
9.	**Dr. Pallawi Upadhaya (Member)** Assistant Professor, Department of Botany S.P. College, Dumka , Sido Kanhu Murmu University, Dumka	10/10/25
10.	**Dr. Arijit Ghosh (Member)** NBAP, University Department of Botany, Sido Kanhu Murmu University, Dumka	10/10/25
11.	**Dipak Kumar Das (Invitee Member)** Assistant Professor , Department of Commerce & Coordinator, NEP-2020 Sido Kanhu Murmu University, Dumka	10/10/25

Bondya 10/10/25

Dr. S.L. Bondya

(Chairperson)

SEMESTER WISE ASOCIATED CORE & ELECTIVE COURSE SUBJECT COMBINATION OF MUSHROOM CULTIVATION

Semester	Course Category	Code	Papers	Credits
Semester II	Associated Core (MUSHROOM CULTIVATION)	AC-MC	Introduction to Mushroom Science	4
Semester IV	Elective Core (MUSHROOM CULTIVATION) - 1	ELC-MC-1	Mushroom Cultivation Techniques	4
Semester VI	Elective Core (MUSHROOM CULTIVATION) - 2	ELC-MC-2	Advanced Mushroom Production and Management	4
Semester VIII	Elective Core (MUSHROOM CULTIVATION) - 3	ELC-MC-3	Fieldwork / Internship / Project Report/ Dissertation	4

INSTRUCTIONS FOR QUESTION SETTER

1. **Semester Internal Examination** (25 Marks)-
   The **Semester Internal Examination (SIE)** will be of **25 marks** in total, which includes **20 marks for the test** and **5 marks for attendance/Class Overall Performance**. The question paper will have **two groups**.
   Group A will have two questions:
   - **Question 1:** Five very short answer questions (1 mark each, total 5 marks)
   - **Question 2:** One short answer question of 5 marks

   Group B will have two descriptive questions of 10 marks each. Students will have to answer **any one** (total 10 marks).
   The remaining **5 marks** will be given based on **class attendance** as follows:
   - Up to 45% attendance: 1 mark
   - 46% to 54%: 2 marks
   - 55% to 64%: 3 marks
   - 65% to 74%: 4 marks
   - 75% and above: 5 marks
2. **End Semester Examination (75 Marks)**
   The **End Semester Examination (ESE)** will be of **75 marks** and will also have **two groups**.
   Group A is compulsory and will have:
   - **Question 1:** Five very short answer questions (1 mark each, total 5 marks)
   - **Questions 2 and 3:** Two short answer questions (5 marks each, total 10 marks)

   Group B will have **six descriptive questions**, each carrying **15 marks**. Students need to answer **any four** (total 60 marks).
   Note: Some questions may be divided into smaller parts if needed

Question Pattern:

Question format for **20 Marks:**

Subject/ Code

F.M. =20 **Time**=1Hr. Exam Year

General Instructions:

i. **Group A** carries very short answer type compulsory questions.
ii. **Answer 1 out of 2** subjective/ descriptive questions given in **Group B**.
iii. Answer in your own words as far as practicable.
iv. Answer all sub parts of a question at one place.
v. Numbers in right indicate full marks of the question.

Group A

1. [5x1=5]
   i. .....
   ii. .....
   iii. .....
   iv. .....
   v. .....
2. ..... [5]

Group B

3. ..... [10]
4. ..... [10]

Note: There may be subdivisions in each question asked in Theory Examination.

Question format for **75 Marks:**

Subject/ Code

F.M. = 75 **Time**=3Hrs. Exam Year

General Instructions:

i. **Group A** carries very short answer type **compulsory** questions.
ii. **Answer 4 out of 6** subjective/ descriptive questions given in **Group B**.
iii. Answer in your own words as far as practicable.
iv. Answer all sub parts of a question at one place.
v. Numbers in right indicate full marks of the question.

Group A

1. [5x1=5]
   i. .....
   ii. .....
   iii. .....
   iv. .....
   v. .....
2. ..... [5]
3. ..... [5]

Group B

4. ..... [15]
5. ..... [15]
6. ..... [15]
7. ..... [15]
8. ..... [15]
9. ..... [15]

Note: There may be subdivisions in each question asked in Theory Examination.

SEMESTER – II

COURSE: ASSOCIATED CORE MUSHROOM CULTIVATION
PAPER: INTRODUCTION TO MUSHROOM SCIENCE
TOTAL CREDITS: THEORY-04
TEACHING HOURS: THEORY-60

EVALUATION		
	External Exam	**Internal Exam**
Full Marks	**75**	25 (20 Written + 5 Attendance/Overall Class Performance)
Duration of Exam	3 Hours	1 Hour
Pass Marks	40 Marks	

COURSE OBJECTIVES:

- To enrich the students with basic information of mushrooms.
- To enable them to identify edible and poisonous mushrooms.
- To provide exposure on various aspects of mushroom cultivation through field visits.

COURSE OUTCOMES: At the end of the course students will be able to:

- Identify edible and poisonous mushrooms.
- Demonstrate the aspects of production and processing of mushrooms.

COURSE CONTENTS:

Unit 1: Introduction to Mushroom (15 Lectures)

- History of mushroom
- Different parts of a typical mushroom
- Variations in mushroom morphology

Unit 2: Mushroom Classification (15 Lectures)

- Based on occurrence
- Natural habitats
- Colour of spores
- Morphology, structure, and texture of fruit bodies

Unit 3: Types of Edible and Medicinal Mushrooms (15 Lectures)

- Characteristics of edible mushrooms
- Characteristics of poisonous mushrooms

Unit 4: Nutritional and Medicinal Properties (15 Lectures)

- Nutritional value of mushrooms
- Medicinal properties of mushrooms
- Scope and opportunities of mushroom cultivation

SUGGESTED READINGS:

- Biswas, Subrata M. Datta, S. V. Ngchan. (2012) Mushrooms: A manual for Cultivation. PHI Learning Pvt Ltd.
- Gogoi, R. Y. Rathaiah, T.R. Borah. (2006). Mushroom cultivation technology, Scientific Publishers, Jodhpur, India.
- Kannaiyan S. & Ramasamy K. (1980). A hand book of edible mushrooms, Today & Tomorrows printers & publishers, New Delhi.
- Nita, B. (2000). Handbook of Mushrooms. Vol 1 & 2. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
- Pandey, R.K. and Ghosh, S.K. (1996). A handbook of Mushroom Cultivation. Emkey Publication.
- Tripathi, D.P (2005). Mushroom Cultivation. Oxford & IBH Publishing Co. Pvt. Ltd, New Delhi.

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SEMESTER – IV

COURSE: MUSHROOM CULTIVATION ELECTIVE COURSE -1 **TOTAL CREDITS:** THEORY-04
PAPER: MUSHROOM CULTIVATION TECHNIQUES **TEACHING HOURS:** THEORY-60

EVALUATION		
	External Exam	**Internal Exam**
Full Marks	**75**	25 (20 Written + 5 Attendance/Overall Class Performance)
Duration of Exam	3 Hours	1 Hour
Pass Marks	40 Marks	

COURSE OBJECTIVES:

- To impart knowledge on the different aspects of cultivation of common edible mushrooms.
- To identify problems encountered during cultivation and management strategies.

COURSE OUTCOMES: At the end of the course students are able to:

- Create a mushroom cultivation unit.
- Apply various procedures required for cultivation of common edible mushrooms 3. detect diseases and pests effectively.

COURSE CONTENTS:

Unit 1: Principles of Mushroom Cultivation (10 Lectures)

- Structure and construction of mushroom house (small village unit & large commercial unit)
- Sterilization of substrates

Unit 2: Mushroom Spawn (Seed) Production (10 Lectures)

- Preparation of pure culture
- Preparation of mother spawn
- Production of planting spawn
- Storage and transportation of spawn
- Criteria for selection of good quality spawn

Unit 3: Cultivation of Button Mushroom (20 Lectures)

- Procurement of raw materials
- Wetting of substrate materials/formulation
- Long method & short method of composting
- Spawn run
- Cropping and harvesting of mushroom
- Post-harvest handling and marketing

Unit 4: Cultivation of Oyster Mushroom (20 Lectures)

- Procurement of raw materials
- Sterilization and treatment of substrate
- Spawning of substrate and filling in containers/bags
- Spawn run
- Cropping and harvesting
- Post-harvest handling and marketing

SUGGESTED READINGS:

- Ahlawat, O.P. R.P. Tewari (2007). Cultivation technology of Paddy straw Mushroom. National Research Centre for Mushroom (ICAR), Chambaghat, Solan, India.
- Biswas, Subrata M. Datta, S. V. Ngchan. (2012) Mushrooms: A manual for Cultivation. PHI Learning Pvt Ltd.
- Gogoi,R. Y. Rathaiah, T.R. Borah. (2006). Mushroom cultivation technology, Scientific Publishers, Jodhpur, India.
- Gupta P. K. Elements of Biotechnology. Rastogi Publications.
- Som, D. 2021. A Practical Manual on Mushroom Cultivation. P.K. Publisher and Distributor. 6. Tripathi, D.P (2005). Mushroom Cultivation. Oxford & IBH Publishing Co. Pvt. Ltd, New Delhi.

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SEMESTER –VI

COURSE: MUSHROOM CULTIVATION ELECTIVE COURSE -2 **TOTAL CREDITS:** THEORY-04
PAPER: ADVANCED MUSHROOM PRODUCTION AND MANAGEMENT **TEACHING HOURS:** THEORY-60

EVALUATION		
	External Exam	**Internal Exam**
Full Marks	**75**	25 (20 Written + 5 Attendance/Overall Class Performance)
Duration of Exam	3 Hours	1 Hour
Pass Marks	40 Marks	

COURSE OBJECTIVES:

- To impart knowledge on the different aspects of cultivation of common edible mushrooms.
- To identify problems encountered during cultivation and management strategies.

COURSE OUTCOMES: At the end of the course students are able to:

- Create a mushroom cultivation unit.
- Apply various procedures required for cultivation of common edible mushrooms.
- Detect diseases and pests effectively.

COURSE CONTENTS:

Unit 1: Cultivation of Paddy Straw Mushroom (20 Lectures)

- Procurement of raw materials and sterilization
- Stacking of paddy straw bundles in layers
- Spawning and cropping
- Harvesting and post-harvest handling

Unit 2: Cultivation of Milky Mushroom (20 Lectures)

- Procurement of raw materials and sterilization
- Casing and case-run
- Exposing bags for cropping
- Harvesting and post-harvest handling

Unit 3: Cultivation of Other Economically Important & Medicinal Mushrooms (15 Lectures)

- Shiitake Mushroom
- Kabul Dhingri (King Oyster) Mushroom
- Reishi (Ganoderma) Mushroom
- Kira Ghas (Cordyceps) Mushroom

Unit 4: Problems in Mushroom Cultivation (05 Lectures)

- Diseases, pests, insects, nematodes, weed molds
- Management strategies

SUGGESTED READINGS:

- Ahlawat, O.P. R.P. Tewari (2007). Cultivation technology of Paddy straw Mushroom. National Research Centre for Mushroom (ICAR), Chambaghat, Solan, India.
- Biswas, Subrata M. Datta, S. V. Ngchan. (2012) Mushrooms: A manual for Cultivation. PHI Learning Pvt Ltd.
- Pathak, V. N. and Yadav, N. (1998). Mushroom Production and Processing Technology. Agrobios, Jodhpur.
- Tewari, P. and Kapoor S.C. (1998). Mushroom Cultivation, Mittal Publication, New Delhi.
- Tripathi, D.P (2005). Mushroom Cultivation. Oxford & IBH Publishing, New Delhi.

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SEMESTER – VIII

COURSE: MUSHROOM CULTIVATION ELECTIVE COURSE -3 **TOTAL CREDITS:** THEORY-04
PAPER: FIELDWORK / PROJECT REPOR/DISSERTATION **TEACHING HOURS:** THEORY-60

COURSE OBJECTIVES:

The objective of this course is to develop students' ability to independently identify, investigate, and analyze a specific problem or topic in their field of study, under the guidance of a faculty supervisor. It aims to equip students with the skills required for systematic research, critical thinking, academic writing, and effective presentation, culminating in the preparation and defense of a comprehensive report or dissertation in accordance with academic and professional standards.

COURSE OUTCOMES: Upon successful completion of this course, students will be able to:

1. Identify and define a research problem/topic relevant to their field of study, demonstrating the ability to formulate clear research objectives.
2. Apply appropriate research methodologies to gather, analyze, and interpret data in alignment with the selected problem/topic.
3. Prepare a comprehensive, well-structured report/dissertation that meets academic standards for formatting, content, and referencing.
4. Demonstrate critical thinking and problem-solving skills through the investigation and analysis of the chosen research area.
5. Present and defend research findings effectively in a viva-voce examination, addressing questions from experts with clarity and confidence.
6. Adhere to academic integrity and professional ethics throughout the research, writing, and presentation process.

COURSE CONTENTS:

Guidelines for Report/Dissertation Submission and Evaluation

The Head of the Department (HOD) shall assign a faculty supervisor to each student individually. Under the guidance of the assigned supervisor, the student shall select a problem/topic and, based on the chosen problem/topic, prepare a comprehensive report or dissertation.

The evaluation of the report/dissertation shall take place at the end of the semester, either before or after the university's external examinations. Each student is required to submit a typed copy of their report/dissertation to the department prior to the viva-voce examination.

The viva-voce examination will be conducted in the presence of an external subject expert, who will be appointed by the Controller of Examinations (COE) or the Principal on the recommendation of the HOD. The external examiner may be selected from the following:

1. A permanent Professor, Associate Professor, or Assistant Professor from a postgraduate department of the University or from any constituent college,

OR

2. A retired Professor, Associate Professor, or Assistant Professor of the University.

Evaluation Pattern (100 marks):

- Field Report / Dissertation (75 marks)
- Viva Voce or Presentation (25 marks)

Suggested topics for dissertation:

- Study of edible mushrooms of Jharkhand.
- Morphological, anatomical and reproductive structure of common mushrooms.
- Study of spawn production.
- Familiarization with different instruments used in mushroom production and its principle using live material/photographs.
- Visit to a local mushroom cultivation unit.
- Study of nutritional and medicinal properties of common mushrooms.
- Commercialization of mushrooms.

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