UNIVERSITY OF JAMMU

(NAAC ACCREDITED 'A' GRADE' UNIVERSITY)
Baba Sahib Ambedkar Road, Jammu-180006 (J&K)

Academic Section
Email: academicsectionju14@gmail.com

NOTIFICATION
(23/April/Adp./17)

It is hereby notified for the information of all concerned that the Vice-Chancellor, in anticipation of the approval of the Academic Council, is pleased to authorize the adoption of the Syllabi and Courses of Studies in the subject of **Sericulture** of **Semester IIIrd and IVth for Four Year Under Graduate Programme (FYUGP)** under the **Choice Based Credit System** as per **NEP-2020 (as given in the annexure)** for the examinations to be held in the years as per the details given below:

Subject	**Semester**	**For the examinations to be held in the year**
Sericulture	Semester-III Semester-IV	December 2023, 2024 and 2025 May 2024, 2025 and 2026

The Syllabi of the courses is also available on the University website: www.jammuuniversity.ac.in.

Sd/-
DEAN ACADEMIC AFFAIRS

No. F. Acd/II/23/ 1885-1925
Dated: 8-5-2023

Copy for information and necessary action to:

1. Dean Faculty of Life-Science
2. HOD/Convener, Board of Studies **Sericulture**
3. All members of the Board of Studies
4. C.A. to the Controller of Examinations
5. Director, Computer Centre, University of Jammu
6. Deputy Registrar/Asst. Registrar (Conf. /Exams. UG)
7. Incharge University Website for necessary action please

Sunitashamo 4/5/23.
Deputy Registrar (Academic)

04/05/23 4/5 4/5/23

Annexure IA

University of Jammu

Syllabi of Sericulture under CBCS as per NEP-2020

SEMESTER- III

(Examination to be held in 2023, 2024, 2025)

Major Course

Course Code: UMJSET-301

Course Title: Mulberry Crop Protection

Credits : 04 {03(Theory) + 01(Practical)}

Total no. of Lectures: Theory: 45 hours

Practical: 30 hours

Maximum Marks: 100

Theory: 75

Practical/ Tutorial: 25

Major Course

Course Code: UMJSET-302

Course Title: Organic Farming in Sericulture

Credits : 04 {03(Theory) + 01(Practical)}

Total no. of Lectures: Theory: 45 hours

Practical: 30 hours

Maximum Marks: 100

Theory: 75

Practical/ Tutorial: 25

Minor Course

Course Code: UMJSET-303

Course Title: Basics of Mulberry Crop Protection

Credits : 03 {02(Theory) + 01(Practical)}

Total no. of Lectures: Theory: 45 hours

Practical: 30 hours

Maximum Marks: 100

Theory: 75

Practical/ Tutorial: 25

Multidisciplinary Course

Course Code: UMDSET-304

Course Title: Principles of Sericulture

Credits : 03 (Theory)

Total no. of Lectures: 45 hours (Theory)

Maximum Marks: 75 (Theory)

Skill Enhancement Course

Course Code: USESET-305 Course

Title: Practices of Silkworm Rearing

Credits : 02 (Theory)

Total no. of Lectures: Theory: 15 hours

Practical: 30 hours

Maximum Marks: 50

Theory: 45

Practical/ Tutorial: 5

UNIVERSITY OF JAMMU

SYLLABI AND COURSE OF STUDY IN SERICULTURE

For the Examination to be held in Year 2023, 2024 & 2025

SERICULTURE COURSE

UG SEMESTER III

UNDER NEP-2020

UNIVERSITY OF JAMMU
SYLLABI AND COURSE OF STUDY IN SERICULTURE
UNDER CBCS AS PER NEP-2020
(For the Examination to be held in Year 2023, 2024 & 2025)
(MAJOR COURSE)

UG SEMESTER-III

MAJOR CORE COURSE NO.	:	**UMJSET-301**
MAJOR CORE COURSE TITLE	:	Mulberry Crop Protection
CREDITS	:	04 (03 Theory) + (1Practicum)
MAXIMUM MARKSTHEORY	:	75
I) External Theory (University Exam)	:	60
II) Internal Assessment	:	15
DURATION OF UNIVERSITY THEORY EXAM:		03 Hours
MAXIMUM MARKS PRACTICALS	:	25
I) Continuous Assessment	:	10
II) Final Examination	:	15

Objectives and Expected Learning Outcomes

The Course has been designed with an objective to make the students familiar with various diseases and pests of mulberry as well as their control measures. The knowledge thus gained by the students shall be useful for better management in sericulture industry. Students may also be able to identify the mulberry diseases and pests that attack mulberry plant during its growth.

Unit-I (13 Hours)

1.1 Concept of Disease & diagnosis. Disease cycle and concept of signs and symptoms. Influence of environmental factors on the occurrence and spread of mulberry diseases.
1.2 Fungal diseases: Leaf spot, powdery mildew, leaf rust and root rot: their causative agent, symptoms, disease cycle and control.
1.3 Leaf blight, trunk rot, stem canker; their causative agents, symptoms, disease cycle and control.

Unit-II (10 Hours)

2.1 Bacterial diseases: its causative agents, symptoms and control measures.
2.2 Viral diseases: its causative agents, symptoms and control measures.
2.3 Mineral deficiency symptoms in mulberry and reclamation.

Unit-III (10 Hours)

3.1 Nematode disease; causative agent, symptoms, disease life cycle and control.

3.2 Extent of damage of fungal, bacterial, viral and nematode diseases of mulberry.
3.3 Season of outbreak of mulberry diseases in temperate and tropical areas.
3.4 Concept of integrated disease management (IDM).

Unit-IV **(12 Hours)**

4.1 A brief account of Pests, Predators and Parasitoids. Classification of pests.
4.2 Pests of mulberry; Major and minor pests of mulberry, their management.
4.3 Common pests of mulberry under rainfed and irrigated system of cultivation.
4.4 Integrated pest management (IPM) in mulberry.

PRACTICUM **(30 Hours)**

1. Collection of mulberry diseased samples and their preservation.
2. Identification of root knot disease, root galls, egg-masses, larvae and nematodes.
3. Preparation of fungicide formulations.
4. Collection, mounting/preservation of insects from mulberry garden
5. Identification of local pests of mulberry.
6. Identification of developmental stages of pests of mulberry with special reference to caterpillars, borers and defoliators.
7. Identification of the symptoms of pest (mulberry) attack.
8. Field visit to mulberry garden to assess the incidence of pests and the types of damage caused by them, application/demonstration of prevention and control measures.
9. Commercial characters of mulberry- some evolved varieties.

NOTE FOR PAPER SETTING

Examination Theory/Practical	Syllabus to be covered in examination	Time allotted for Exam	Marks
Internal Theory Assessment	50%	1 Hr & 30 Minutes	15
External Theory End Semester	100%	3 Hrs	60
Continuous assessment	-	-	10 (Based on Daily Performance only)
Final examination	-	-	15

External End Semester Theory Examination will have two sections (A & B) {Total marks 60}

Section A : Four short answer questions representing all units/syllabi i.e.,atleast one question fromeach unit. Each question shall be of 3 marks.

Section B: Eight long answer questions representing whole of the syllabi i.e.,two questions from each unit. Each question shall be of 12 marks. The candidate has to attempt 4 questions selecting one from each unit.

Internal Assessment {Total marks 15}

Fifteen (15) marks for theory paper in a subject reserved for internal assessment shall have one longanswer type question of 7 marks and four short answer type questions of 2 marks each.

Recommended Readings

1. Ganga, G. and Chetty, S. (2008) An Introduction to Sericulture. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
2. Ganga, G., (2003) Comprehensive Sericulture- Vol.-1 Moriculture, Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
3. Madan Mohan Rao, M. (2019). An Introduction to Sericulture. (Ed. 2). B S Publications.
4. Singh, R.N. and Saratchandra, B. (2011) Sericultural Entomology. APH Publishing Corporation, New Delhi.
5. Govindaiah, Gupta, V.P., Sharma, D.D., Rajadurai, S. and Naik, Nishitta (2005) Mulberry Crop Protection. Central Silk Board, Bangalore.
6. Aruga, H. Principles of Sericulture. Oxford and IBH Publishing Co. Pvt. Ltd. New Delhi, Bombay and Calcutta.
7. Khan, M.A., Dhar, A., Zeya, S.B and Trag, A.R. (2004) Pests and Diseases of Mulberry and their Management. Publisher Bishan Singh and Mahendra Pal Singh, New Connaught Palace, Dehradun.
8. Kamili, A.S. and Masoodi, A.M. (2004). Principles of Temperate Sericulture. Kalyani Publishers, New Delhi.

UNIVERSITY OF JAMMU
SYLLABI AND COURSE OF STUDY IN SERICULTURE
UNDER CBCS AS PER NEP-2020
(For the Examination to be held in Year 2023, 2024 & 2025)
(MAJOR COURSE)
UG SEMESTER-III

MAJOR CORE COURSE NO.	:	**UMJSET-302**
MAJOR CORE COURSE TITLE	:	Organic Farming in Sericulture
CREDITS	:	04 (03 Theory) + (1Practicum)
MAXIMUM MARKSTHEORY	:	75
I) External Theory (University Exam)	:	60
II) Internal Assessment	:	15
DURATION OF UNIVERSITY THEORY EXAM:		03 Hours
MAXIMUM MARKS PRACTICALS	:	25
I) Continuous Assessment	:	10
II) Final Examination	:	15

Objectives and Expected Learning Outcomes The course is designed in such a wa that the students could understand the use of sustainable practices for the production of mulberry by usi organic resources and giving more stress on organic farming practices with the application of bio fertilizer green manures and vermicomposting. The students will also able to get knowledge about the preparation ar application of bio pesticides.

Unit-I
(12 Hours)

1.1 Need of organic farming, its objectives
1.2 Bio Fertilizers: Definition and scope, Types of Biofertilizers-Rhizobium-Azotobactor-Cyno bacteria-Azolla-PSM-AM fungi-SSB
1.3 Mass Production of Biofertilizers and method of preparation.

Unit-II
(10 Hours)

2.1 Application of Nitrogen fixing, Phosphate solubilizing, phosphate mobilizing Biofertilizers for Micronutrients.
2.2 Plant growth and promoting Rhizo bacteria
2.3 Liquid Biofertilizers, their characteristics.
2.3 Constraints in Biofertilizers technology
2.4 Economics of Biofertilizers

Unit-III
(10 Hours)

3.1 Definition and scope of bio pesticides
3.2 Types, Methods of preparation of bio pesticides
3.3 Application of bio pesticides.
3.4 Definition and scope of vermicomposting, method of preparation of Vermicompost pit, applicatio dose for mulberry

Unit-IV
(13 Hours)

4.1 Definition and scope of green manuring
4.2 Green manuring crops, cropping system, Plant species suitable for green manuring
4.3 Manures vs chemical fertilizers
4.4 Types of green manures, production of green manures and application of green manures

PRACTICUM

(30 Hours)

1. Preparation of Vermicompost.
2. Preparation of Bio pesticides
3. Preparation of Bio fertilizers
4. Identification of Green Manure Crops
5. Raising of 1-2 Green manure crop
6. Establishment of Vermicompost pit
7. Preparation of organic manure pit
8. Observation of Organic farming activities in the area

NOTE FOR PAPER SETTING

Examination Theory/Practical	Syllabus to be covered in examination	Time allotted for Exam	Marks
Internal Theory Assessment	50%	1 Hr & 30 Minutes	15
External Theory End Semester	100%	3 Hrs	60
Continuous assessment	-	-	10 (Based on Daily Performance only)
Final examination	-	-	15

External End Semester Theory Examination will have two sections (A & B) {Total marks 60}

Section A : Four short answer questions representing all units/syllabi i.e.,atleast one question fromeach unit. Each question shall be of 3 marks.
Section B: Eight long answer questions representing whole of the syllabi i.e.,two questions from each unit. Each question shall be of 12 marks. The candidate has to attempt 4 questions selecting one from each unit.

Internal Assessment {Total marks 15}

Fifteen (15) marks for theory paper in a subject reserved for internal assessment shall have one longanswer type question of 7 marks and four short answer type questions of 2 marks each.

Recommended Readings

1. Hortmann and Kesler (1993) Plant propagation, Principal and practices. Prentice Hall, Hemel Nemstead.
2. Govindaiah, Gupta, V.P., Sharma, D.D., Rajadurai, S. and Naik, Nishitta (2005) Mulberry Crop Protection. Central Silk Board, Bangalore.
3. Krishnamurthy, N. (1981) Plant growth substances including application in Agriculture. Tata McGraw Hill Pub. Co. Ltd. New Delhi.

4. Shankar., M.A (1998) Handbook of mulberry Nutrition, Multiplex, Bangalore.
5. Subha Roa, N.S (1998) Biofertilizers in Agriculture. Oxford & IBH Pub. Co. Pvt. Ltd. New Delhi.

UNIVERSITY OF JAMMU
SYLLABI AND COURSE OF STUDY IN SERICULTURE
UNDER CBCS AS PER NEP-2020
(For the Examination to be held in Year 2023, 2024 & 2025)
(MINOR COURSE)
UG SEMESTER-III

MINOR CORE COURSE NO.	:	**UMISET-303**
MINOR CORE COURSE TITLE	:	Basics of Mulberry Crop Protection
CREDITS	:	03 (Theory) +1 (Practicum)
MAXIMUM MARKSTHEORY	:	75
I) External Theory (University Exam)	:	60
II) Internal Assessment	:	15
DURATION OF UNIVERSITY THEORY EXAM	:	**03 Hours**
MAXIMUM MARKS PRACTICALS	:	25
I) Continuous Assessment	:	10
II) Final Examination	:	15

Objectives and Expected Learning Outcomes

The Course has been designed with an objective to make the students familiar with various diseases and pests of mulberry as well as their control measures. The knowledge thus gained by the students shall be useful for better management in sericulture industry. Students may also be able to identify the mulberry diseases and pests that attacks mulberry plant during its growth.

Unit-I **(13 Hours)**

1.1 Concept of Disease & diagnosis. Disease cycle and concept of signs and symptoms. Influence of environmental factors on the occurrence and spread of mulberry diseases.

1.2 Fungal diseases: Leaf spot, powdery mildew, leaf rust and root rot: their causative agent, symptoms, disease cycle and control.

1.3 Leaf blight, trunk rot, stem canker; their causative agents, symptoms, disease cycle and control.

Unit-II **(10 Hours)**

2.1 Bacterial diseases: its causative agents, symptoms and control measures.

2.2 Viral diseases: its causative agents, symptoms and control measures.

2.3 Mineral deficiency symptoms in mulberry and reclamation.

Unit-III **(10 Hours)**

3.1 Nematode disease; causative agent, symptoms, disease life cycle and control.

3.2 Extent of damage of fungal, bacterial, viral and nematode diseases of mulberry.

3.3 Season of outbreak of mulberry diseases in temperate and tropical areas.

3.3 Concept of integrated disease management (IDM).

Unit-IV **(12 Hours)**

4.1 A brief account of Pests, Predators and Parasitoids. Classification of pests.

4.2 Pests of mulberry; Major and minor pests of mulberry, their management.

4.3 Common pests of mulberry under rainfed and irrigated system of cultivation.

4.4 Integrated pest management (IPM) in mulberry.

PRACTICUM **(30 Hours)**

1. Collection of mulberry diseased samples and their preservation.
2. Identification of root knot disease, root galls, egg-masses, larvae and nematodes.
3. Preparation of fungicide formulations.
4. Collection, mounting/preservation of insects from mulberry garden
5. Identification of local pests of mulberry.
6. Identification of developmental stages of pests of mulberry with special reference to caterpillars, borers and defoliators.
7. Identification of the symptoms of pest (mulberry) attack.
8. Field visit to mulberry garden to assess the incidence of pests and the types of damage caused by them, application/demonstration of prevention and control measures.
9. Commercial characters of mulberry- some evolved varieties.

NOTE FOR PAPER SETTING

Examination Theory/Practical	Syllabus to be covered in examination	Time allotted for Exam	Marks
Internal Theory Assessment	50%	1 Hr & 30 Minutes	15
External Theory End Semester	100%	3 Hrs	60
Continuous assessment	-	-	10 (Based on Daily Performance only)
Final examination	-	-	15

External End Semester Theory Examination will have two sections (A & B) {Total marks 60}

Section A : Four short answer questions representing all units/syllabi i.e.,atleast one question fromeach unit. Each question shall be of 3 marks.

Section B: Eight long answer questions representing whole of the syllabi i.e.,two questions from each unit. Each question shall be of 12 marks. The candidate has to attempt 4 questions selecting one from each unit.

Internal Assessment {Total marks 15}

Fifteen (15) marks for theory paper in a subject reserved for internal assessment shall have one longanswer type question of 7 marks and four short answer type questions of 2 marks each.

Recommended Readings

1. Ganga, G. and Chetty, S. (2008) An Introduction to Sericulture. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
2. Ganga, G., (2003) Comprehensive Sericulture- Vol.-1 Moriculture, Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
3. Madan Mohan Rao, M. (2019). An Introduction to Sericulture. (Ed. 2). B S Publications.
4. Singh, R.N. and Saratchandra, B. (2011) Sericultural Entomology. APH Publishing Corporation, New Delhi.
5. Govindaiah, Gupta, V.P., Sharma, D.D., Rajadurai, S. and Naik, Nishitta (2005) Mulberry Crop Protection. Central Silk Board, Bangalore.
6. Aruga, H. Principles of Sericulture. Oxford and IBH Publishing Co. Pvt. Ltd. New Delhi, Bombay and Calcutta.
7. Khan, M.A., Dhar, A., Zeya, S.B and Trag, A.R. (2004) Pests and Diseases of Mulberry and their

Management. Publisher Bishan Singh and Mahendra Pal Singh, New Connaught Palace, Dehradun.

8. Kamili, A.S. and Masoodi, A.M. (2004). Principles of Temperate Sericulture. Kalyani Publishers, New Delhi.

UNIVERSITY OF JAMMU
SYLLABI AND COURSE OF STUDY IN SERICULTURE
UNDER CBCS AS PER NEP-2020
(For the Examination to be held in Year 2023, 2024 & 2025)
(MULTIDISCIPLINARY COURSE)
UG SEMESTER-III

MULTIDISCIPLINARY COURSE NO.	:	**UMDSET-304**
MULTIDISCIPLINARY COURSE TITLE	:	Principles of Sericulture
CREDITS	:	03
MAXIMUM MARKS THEORY	:	75
I) External Theory (University Exam)	:	60
II) Internal Assessment	:	15
DURATION OF UNIVERSITY THEORY EXAM	:	03 Hours

Objectives and Expected Learning Outcomes

To acquaint the students with basic understanding of Sericulture, its history, characteristics, world output of silk, Central Silk Board and a detail account of textile fibre including silk. Upon successful completion of this course, the student should be able to know about Sericulture, organizational set up the apex bodies and the properties of silk and other textile fibres.

UNIT-I (13 Hours)

1.1 Introduction to Sericulture: Scope and Importance of mulberry and non-mulberry sericulture in India

1.2 Origin and history of sericulture in India and other Countries, Silk route

1.3 World Output of Silk in different countries. Silk Industry in India – West Bengal, Jammu and Kashmir, Karnataka, Tamil Nadu, Andhra Pradesh, and other states. Mulberry areas, sericulture villages, no. of families, cocoon and silk production

1.4 Characteristics of sericulture industry.

1.5 Role of sericulture in rural development.

UNIT-II (10 Hours)

2.1 Organization set up of Central Silk Board, Jammu and Kashmir Development Department with special reference to Sericulture

2.2 Role of Central Silk Board in research and development of sericulture in different states of India.

2.3 Participation of women in Mulberry garden

UNIT-III (10 Hours)

3.1 Silk grading

3.2 Brief account of silk conditioning and testing

3.3 By-products of sericulture

3.4 Utilization of by-products of mulberry silkworm, pupae and moths

UNIT-IV (12 Hours)

4.1 Introduction to textile fibers; types: natural and synthetic fibers; importance, role of silk

fibers amongst natural fibres

4.2 Physical and chemical properties of silk

4.3 Advantages of silk fiber over the natural fibres

4.4 A comparative study of mulberry sericulture vis-à-vis other agriculture crops

4.5 Prospects and problems of sericulture industry.

NOTE FOR PAPER SETTING

Examination Theory/Practical	Syllabus to be covered in Examination	Time allotted for Exam	Marks
Internal Theory Assessment	50%	1 Hr. & 30 Minutes	15
External Theory End Semester	100%	3 Hrs.	60

External End Semester Theory Examination will have two sections (A & B) {Total marks 60}

Section A : Four short answer questions representing all units/syllabi i.e., one question from each unit. Each question shall be of 3 marks.

Section B: Eight long answer questions representing whole of the syllabi i.e., two questions from each unit. Each question shall be of 12 marks. The candidate has to attempt 4 questions selecting one from each unit.

Internal Assessment {Total marks 15}

Fifteen (15) marks for theory paper in a subject reserved for internal assessment shall have one long answer type question of 7 marks and four short answer type questions of 2 marks each

Recommended Readings

1. Ganga, G. and Chetty, S. (2008) An Introduction to Sericulture. Oxford and IBH Publishing Co. Pvt. Ltd.,New Delhi.
2. Ganga, G., (2003) Comprehensive Sericulture- Vol.-2 Silkworm Rearing and Silk Reeling, Oxford andIBH Publishing Co. Pvt. Ltd., New Delhi.
3. Singh, Tribhuwan and Sarachandra, Beera (2004) Principles and Techniques of Silkworm SeedProduction. Discovery Publishing House, New Delhi.
4. Rajan, R. K., and Himantharaj, M. T. (2005) Silkworm Rearing Technology. Central Silk Board,Bangalore.
5. Johnson, M. and Kesary, M. (2020). Sericulture. (Ed. 1). Saras Publication.
6. Sarkar, S. (2022). A Textbook on Sericulture. (Ed. 1). Publisher Techno World.
7. Sarwar, S., Hussain, I. and Ahmad, A. Introduction to Sericulture Industry (LatestEdition). Bisma Books.
8. Chawala, N. K., (2017). Comprehensive Sericulture: Silkworm Rearing and Silk Rearing. Indian Booksand Periodicals.
9. Madan Mohan Rao, M. (2019). An Introduction to Sericulture. (Ed. 2). B S Publications.
10. Ramamoorthy, R., Umapathy, G., Ambethgar, V. and Selvanarayanan, V. (2019). Glossary of Sericulture (Ed. 1) Aknik Publications
11. Bhaskar, R. N. and Anusha, H. G. (2002) Objective Question Bank on Sericulture, Agri Biovet Press.
12. , D. Halliyal, V.G. *et. al.,* (2000) Mulberry Silk Reeling Technology. Oxford and IBH publishing Co. Pvt.Ltd, New Delhi.
13. Sonwalker, T.N. (2001) Hand Book of Silk Technology. New Age International (P) limited, New Delhiand Mumbai.
14. Ananthanarayan, S.K. (2008) Silk Reeling. Biotech Books, Delhi.

NOTE FOR PAPER SETTING

Examination Theory/Practical	Syllabus to be covered in Examination	Time allotted For Exam	Marks
Internal Theory Assessment	50%	1 Hr. & 30 Minutes	15
External Theory End Semester	100%	3 Hrs.	60

External End Semester Theory Examination will have two sections (A & B) {Total marks 60}

Section A : Four short answer questions representing all units/syllabi i.e., one question from each unit.Each question shall be of 3 marks.

Section B: Eight long answer questions representing whole of the syllabi i.e.,two questions from each unit. Each question shall be of 12 marks. The candidate has to attempt 4 questions selecting one from each unit.

Internal Assessment {Total marks 15}

Fifteen (15) marks for theory paper in a subject reserved for internal assessment shall have one long answer type question of 7 marks and four short answer type questions of 2 marks each

Recommended Readings

1. Singh, R.N., Sinha, M.K., Bajpeyi, C.M., Sinha, A.K. and Tikader, A. (2014) Tasar Culture. APH Publishing Corporation, New Delhi.
2. Singh, R.N. and Saratchandra, B. (2012) Eri Culture, APH Publication Corporation New Delhi-110002.
3. Sarakar, D.C., Thangavelu, K, *et. al.,* Ericulture in India. Central Silk Board, Banglore.
4. Anonymous. Wild Silk of India (Vol.-I) An Introduction to Vanaya Silk. Central Silk Board, Banglore.
5. Goel, R.K., Krishna Rao, J.V. (2004) Oak Tasar Culturre. A.P.H. Publishing Corporation, New Delhi.
6. Mohanty, P.K., (1998) Tropical Tasar Culture in India. Daya Publishing House, Delhi.
7. Mohanty, P.K. (2003) Tropical Wild Silk cocoons of India. Daya Publishing House, Delhi.

UNIVERSITY OF JAMMU
SYLLABI AND COURSE OF STUDY IN SERICULTURE
UNDER CBCS AS PER NEP-2020
(For the Examination to be held in Year 2023, 2024 & 2025)
(SKILL ENHANCEMENT COURSE)
UG SEMESTER-III

SKILL ENHANCEMENT COURSE NO.	:	**USESET-305**
SKILL ENHANCEMENT COURSE TITLE	:	Practices of Silkworm Rearing
CREDITS	:	02
MAXIMUM MARKSTHEORY	:	50
I) External Theory (University Exam)	:	40
II) Internal Assessment	:	10
DURATION OF UNIVERSITY EXAM	:	02 Hours

Objectives and Expected Learning Outcomes

The course is designed to introduce the Students to the basic theoretical and technological aspects of silkworm rearing and other aspects essential for Sericulture industry. The knowledge thus gained by the students could not only be useful for them as an extension specialist in Sericulture but would also be helpful in case the students wish to do something for self-employment or for generating supplementary income for their families.

Unit-I

(7 Hours)

1.1 Introduction to Silkworm Rearing; life cycle of silkworm *Bombyx mori* L.
1.2 Rearing appliances and their uses. C.S.B. proposed model rearing house.
1.3 Disinfection and its methods; common disinfectants,
1.4 Concept of bed cleaning, frequency of bed cleaning and feeding of worms
1.5 Estimation of leaf quality and yield- appropriate time for estimation of leaf yield, method and calculation of brushing capacity based on yield.

Unit-II

(8 Hours)

2.1 Maintaining optimum condition of rearing, brushing, frequency of spacing.
2.2 Moulting; symptoms of moulting worms and care during mounting
2.3 Ecdysis and metamorphosis: its importance.
2.4 Rearing method: chawki and Late age Silkworm rearing, Chawki garden and Chawki Rearing Centers (CRC's)
2.5 Mounting and mountage, process of spinning, cocoon harvesting, Defective cocoons and its types.

Unit-III Practical

(30 Hours)

1.Cocoon characters of popular uni, bi, and multi voltine races
2. Model rearing house-types of rearing houses
3. Rearing appliances
4.Disinfection-Types of disinfectants, effective concentration of disinfectants, preparation of disinfectants.

5. Incubation of silkworm eggs- black boxing, percentage of hatching, recording of temperature and humidity.
6. Estimation of leaf yield, moisture contents and harvesting methods.
7.. Mulberry leaf estimation -Harvesting and preservation techniques -leaf selection for different instars.
8. Moulting -identification of moulting, larvae, moulting care
9. Mountages and harvesting, cocoon assessment and preparation of harvest report.
10. Visit to local progressive sericulturists.
11. Rearing of silkworms (Compulsory)

NOTE FOR PAPER SETTERS

Total Marks of the USESET-305 is 50 of which 20% marks shall be reserved for internal assessment (10 marks). Remaining 80% of the marks (40 marks) shall be reserved for external examination to be conducted by the University/Colleges.

Internal Assessment Test (10 Marks)

Internal Assessment Paper of 10 Marks shall consist of Theory Question/s of 5 Marks from Unit I/II and 5 Marks of Practical Exercise from Unit III.

External End semester University / College Examination

External Theory Exam shall be of 40 Marks and consist of 2 sections:

Section A: Four (4) short answer questions representing all Units/Syllabi i.e., atleast one question from each unit. Each question shall be of 2.5 marks (All Compulsory)

Section B: Six long answer questions representing whole of the syllabi i.e., two questions from each unit. Each question shall be of 10 marks. The candidate has to attempt 3 questions selecting one from each unit.

RECOMMENDED READINGS

1. Ganga, G. and Chetty, S. (2008) An Introduction to Sericulture. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
2. Ganga, G., (2003) Comprehensive Sericulture- Vol.-1 Moriculture, Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
3. Ganga, G., (2003) Comprehensive Sericulture- Vol.-2 Silkworm Rearing and Silk Reeling, Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
4. Anathanarayanan, S.K. (2008) Silkworm Rearing. Biotech Books, New Delhi.
5. Patnaik, R.K. (2008) Sericulture Manual. Biotech Books, New Delhi.
6. Dandin, S.B., Jayaswal, J. and Giridhar, K., Handbook of Sericulture Technologies. Central Silk Board, Bangalore.
7. Ullal, S.R., Narasimhanna, M.N. (Ed. 1994) Handbook of Practical Sericulture. Central Silk Board, Bangalore.
8. Rajan, R.K., and Himantharaj, M.T. (Ed. 2005) Silkworm Rearing Technology. Central Silk Board, Bangalore.
9. Aruga, H. Principles of Sericulture. Oxford and IBH Publishing Co.Pvt. Ltd. New Delhi, Bombay and Calcutta.
10. Narasiah, M. Laxmi, R. and Raya, G (1999) Development of Sericulture. Discovery Publishing House, New Delhi.
11. Kamili, A.S. and Masoodi, A.M. (2004). Principles of Temperate Sericulture. Kalyani Publishers, New Delhi-110002.

Annexure I B

University of Jammu

Syllabi of Sericulture under CBCS as per NEP-2020

SEMESTER- IV

(Examination to be held in 2024, 2025, 2026)

Major Course

Course Code: UMJSET-401

Course Title: Silkworm Crop Protection

Credits : 04 {03(Theory) + 01(Practical)}

Total no. of Lectures: Theory: 45 hours

Practical: 30 hours

Maximum Marks: 100

Theory: 75

Practical/ Tutorial: 25

Major Course

Course Code: UMJSET-402

Course Title: Silkworm Seed Technology

Credits : 04 {03(Theory) + 01(Practical)}

Total no. of Lectures: Theory: 45 hours

Practical: 30 hours

Maximum Marks: 100

Theory: 75

Practical/ Tutorial: 25

Major Course

Course Code: UMJSET-403

Course Title: Silk Reeling Technology

Credits : 04 {03(Theory) + 01(Practical)}

Total no. of Lectures: Theory: 45 hours

Practical: 30 hours

Maximum Marks: 100

Theory: 75

Practical/ Tutorial: 25

Major Course

Course Code: UMJSET-404

Course Title: Value Addition in Sericulture

Credits : 04 {03(Theory) + 01(Practical)}

Total no. of Lectures: Theory: 45 hours

Practical: 30 hours

Maximum Marks: 100

Theory: 75

Practical/ Tutorial: 25

Minor Course

Course Code: UMISET-405

Course Title: Basics of Silkworm Crop Protection

Credits : 04 {03(Theory) + 01(Practical)}

Total no. of Lectures: Theory: 45 hours

Practical: 30 hours

Maximum Marks: 100

Theory: 75

Practical/ Tutorial: 25

UNIVERSITY OF JAMMU

SYLLABI AND COURSE OF STUDY IN SERICULTURE

For the Examination to be held in Year 2024, 2025 & 2026

SERICULTURE COURSE

UG SEMESTER IV

UNDER NEP-2020

UNIVERSITY OF JAMMU
SYLLABI AND COURSE OF STUDY IN SERICULTURE
UNDER CBCS AS PER NEP-2020
(For the Examination to be held in Year 2024, 2025 & 2026)
(MAJOR COURSE)
UG SEMESTER-IV

MAJOR CORE COURSE NO.	:	**UMJSET-401**
MAJOR CORE COURSE TITLE	:	Silkworm Crop Protection
CREDITS	:	04 (03 Theory) + (1Practicum)
MAXIMUM MARKSTHEORY	:	75
I) External Theory (University Exam)	:	60
II) Internal Assessment	:	15
DURATION OF UNIVERSITY THEORY EXAM:		03 Hours
MAXIMUM MARKS PRACTICALS	:	25
I) Continuous Assessment	:	10
II) Final Examination	:	15

Objectives and Expected Learning Outcomes

The Course has been designed with an objective to make the students familiar with various diseases and pests of mulberry silkworms as well as their control measures. The knowledge thus gained by the students shall be useful for better management in sericulture industry. Students may also be able to identify the mulberry silkworm diseases and pests that attacks mulberry silkworms during rearing.

Unit-I (13 Hours)

1.1 Introduction and classification of different types of silkworm diseases.
1.2 Influence of environment and nutrition on the incidence of diseases.
1.3 Pebrine-Symptomology, Source and mode of infection, prevention control measures.
1.4 Structure and life history of Nosema bombycis

Unit-II (10 Hours)

2.1 Flacherie-Causative agents, symptoms of different type of Flacherie diseases.
2.2 Factors influencing Flacherie, Sources, mode of infection, prevention and control measure Flacherie
2.3 Grasserie-symptoms of different types of Grasserie disease and causative agents.
2.4 Sources and mode of infection of Grasserie, Prevention and control measures of Grasserie.

Unit-III (10 Hours)

3.1 Muscardine-Symptoms of different types of Muscardine with Special reference to Beuveria.
3.2 Mode of infection, prevention and control measures of Beuveria Muscardine.
3.3 General account of disinfection and the efficacy of different disinfectants.

Unit-IV (12 Hours)

4.1 Definition of pests, parasitoids and predators.

4.2 Sampling methods of pests- economic injury level, economic threshold.

4.3 Pests of Silkworm: Life cycle, nature of damage, prevention and control measures of Techinid (Uzi) fly.

4.4 Nature of damage, prevention and control of Dermestids, ants, rodents and lizards.

PRACTICUM

(30 Hours)

1. Morphological features of Pebrine infected eggs, larvae, pupae and moths
2. Morphological features in larvae-infected by different bacteria.
3. Morphological features in larvae-infected by different viruses.
4. Examination of larvae, Pupae and moth infected with fungal diseases.
5. Practical knowledge of various chemicals used to control silkworm diseases &method of applications.

NOTE FOR PAPER SETTING

Examination Theory/Practical	Syllabus to be covered in examination	Time allotted for Exam	Marks
Internal Theory Assessment	50%	1 Hr & 30 Minutes	15
External Theory End Semester	100%	3 Hrs	60
Continuous assessment	-	-	10 (Based on Daily Performance only)
Final examination	-	-	15

External End Semester Theory Examination will have two sections (A & B) {Total marks 60}

Section A : Four short answer questions representing all units/syllabi i.e., atleast one question fromeach unit. Each question shall be of 3 marks.

Section B: Eight long answer questions representing whole of the syllabi i.e.,two questions from each unit. Each question shall be of 12 marks. The candidate has to attempt 4 questions selecting one from each unit.

Internal Assessment {Total marks 15}

Fifteen (15) marks for theory paper in a subject reserved for internal assessment shall have one longanswer type question of 7 marks and four short answer type questions of 2 marks each.

Recommended Readings

1. Ganga, G. and Chetty, S. (2008) An Introduction to Sericulture. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
2. Ganga, G., (2003) Comprehensive Sericulture- Vol.-2 Silkworm Rearing and Silk Reeling, Oxford andIBH Publishing Co. Pvt. Ltd., New Delhi.
3. Khan, Md. A., Bhat, M.M and Singh, T. (2011) Silkworm Crop Protection- Concepts and Approaches. Daya Publishing House, Delhi.
4. Singh, R.N. and Saratchandra, B. (2011) Sericultural Entomology. APH Publishing Corporation, New Delhi.

5. B. Nataraju, K Salhyaprasad *et.al.*, (2005) Silkworm crop Protection, Central Silk Board, Bangalore.
6. Aruga, H. Principles of Sericulture. Oxford and IBH Publishing Co. Pvt. Ltd. New Delhi, Bombay and Calcutta.
7. Khan, M.A., Dhar, A., Zeya, S.B and Trag, A.R. (2004) Pests and Diseases of Mulberry and their Management. Published by Bishan Singh and Mahendra Pal Singh, New Connaught Palace, Dehradun.
8. Kamili, A.S. and Masoodi, A.M. (2004). Principles of Temperate Sericulture. Kalyani Publishers, New Delhi-110002.

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UNDER CBCS AS PER NEP-2020
(For the Examination to be held in Year 2024, 2025 & 2026)
(MAJOR COURSE)
UG SEMESTER-IV

MAJOR CORE COURSE NO.	:	**UMJSET-402**
MAJOR CORE COURSE TITLE	:	Silkworm Seed Technology
CREDITS	:	04 (03 Theory) + (1Practicum)
MAXIMUM MARKSTHEORY	:	75
I) External Theory (University Exam)	:	60
II) Internal Assessment	:	15
DURATION OF UNIVERSITY THEORY EXAM	:	03 Hours
MAXIMUM MARKS PRACTICALS	:	25
I) Continuous Assessment	:	10
II) Final Examination	:	15

Objectives and Expected Learning Outcomes

The course is designed in such a way that it will introduce the students to the basic theoretical and technological aspects of silkworm seed production. It will also provide the knowledge of grainage activities as quality silkworm seed is backbone of sericulture industry and the course will also provide essential aspects that are associated with seed technology.

Unit-I (12 Hours)

1.1 A general account of silkworm seed, grainages production and demand trends
1.2 Significance of seed organization, maintenance of parental stock and its multiplication.
1.3 Identification of areas of seed rearers, seed legislation act- rules and regulations.
1.4 Screening of egg shells, larvae and faecal matter for diseases, Maintenance of hygienic conditions during seed rearing.

Unit-II (10 Hours)

2.1 Disinfection in the seed production units.
2.2 Role of temperature, humidity, Light and air in Cocoon preservation and oviposition.
2.3 Brief account of seed production centres, Organization and function of seed production centers
2.4 Plan of Model Grainage inclusive of cold storage facilities, Infrastructure for SPC requirement of each room, equipments and their utilization.
2.5 Procurement, transportation, processing and preservation of seed cocoon, Sex separation in seed production and Importance of synchronization emergence.

2.6 Pairing of moth: Rejection of weak and deformed moths. Duration and isolation of pairing and effect of delayed pairing. Potency and reuse of male moths

Unit-III **(10 Hours)**

3.1 Mother moth examination: Individual, sampling and mass methods of examination. Advantages and disadvantages of various methods.

3.2 General account of handling and preservation of multivoltine eggs.

3.3 Handling of bivoltine eggs for early hatching: Physical and chemical methods, Hot and cold acid treatments-advantages and disadvantages.

3.4 Long term preservation.

Unit-IV **(13 Hours)**

4.1 Staff and labour requirement, grainage equipment and their maintenance.

4.2 Monitoring and supervision-rapport with seed cocoon growers, arrangement for seed, cocoon procurement and its maintenance.

4.3 Planning for seed cocoon production-programme of brushing, synchronized brushing of races in villages.

4.4 Economics of seed production, Cost of seed cocoon, cold storing of eggs, depreciation cost on the equipment, interest on capital for purchase of seed cocoon, cost of chemicals, equipments, egg, sheets, stationery furniture and miscellaneous contingent expenditure.

4.5 Maintenance of records and protective measure of seed production.

PRACTICUM **(30 Hours)**

1. Surface sterilization of silkworm eggs.
2. Mother moth examination-individual and mass, whole and sampling methods
3. Processing of seed cocoons, deflossing, sorting, selection of good cocoons, assessment of good cocoon
4. Pupal examination
5. Cutting of seed cocoon, seed separation by pupal method-preservation of cocoon/pupa, maintenance of temperature, humidity and light factors.
6. Plan of model grainage building and grainage equipments-visits to the commercial grainage and maintenance of record in the grainage.
7. Visit to multivoltine and bivoltine seed (seed rearers) seed farms and cocoon markets.

NOTE FOR PAPER SETTING

Examination Theory/Practical	Syllabus to be covered in examination	Time allotted for Exam	Marks
Internal Theory Assessment	50%	1 Hr & 30 Minutes	15
External Theory End Semester	100%	3 Hrs	60

Continuous assessment	-	-	**10 (Based on Daily Performance only)**
Final examination	-	-	**15**

External End Semester Theory Examination will have two sections (A & B) {Total marks 60}

Section A : Four short answer questions representing all units/syllabi i.e.,atleast one question fromeach unit. Each question shall be of 3 marks.

Section B: Eight long answer questions representing whole of the syllabi i.e.,two questions from each unit. Each question shall be of 12 marks. The candidate has to attempt 4 questions selecting one from each unit.

Internal Assessment {Total marks 15}

Fifteen (15) marks for theory paper in a subject reserved for internal assessment shall have one longanswer type question of 7 marks and four short answer type questions of 2 marks each.

Recommended Readings

1. Ganga, G. and Chetty, S. (2008) An Introduction to Sericulture. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
2. Ganga, G., (2003) Comprehensive Sericulture- Vol.-1 Moriculture. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
3. Ganga, G., (2003) Comprehensive Sericulture- Vol.-2 Silkworm Rearing and Silk Reeling. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
4. Goel, R.K. Laboratory techniques in Sericulture. Central Silk Board, Bangalore.
5. Singh, T. and Saratchandra, B. (2004) Principles and Techniques of Silkworm Seed Production. Discovery Publishing House, New Delhi.
6. Singh,T., Bhat, M.M. and Khan, Md. A. (2010) Silkworm Egg Science Principles and Protocols. Daya Publishing House, New Delhi.
7. Ullal, S.R. and Narasimhana, M.N. (1994) Handbook of Practical Sericulture. Central Silk Board, Bangalore.
8. Anonymous, (1997) Silkworm and Egg Production. Oxford and IBH Publishing Co. Pvt. Ltd.
9. Koshy,T.D. (2011) Silk Production and Export Management. APH Publishing Corporation, New Delhi.

SEMESTER-4
TITLE-Silk Reeling Technology
COURSE CODE-UMJSET-403 (2024-26)

(For the Examination to be held in Year 2024, 2025 & 2026)

(MAJOR COURSE)

UG SEMESTER-IV

MAJOR CORE COURSE NO.	:	**UMJSET-403**
MAJOR CORE COURSE TITLE	:	Silk Reeling Technology
CREDITS	:	04 (03 Theory) + (1Practicum)
MAXIMUM MARKSTHEORY	:	75
I) External Theory (University Exam)	:	60
II) Internal Assessment	:	15
DURATION OF UNIVERSITY THEORY EXAM:		03 Hours
MAXIMUM MARKS PRACTICALS	:	25
I) Continuous Assessment	:	10
II) Final Examination	:	15

Objectives and Expected Learning Outcomes

During the study of this course the students will able to understand the basic theoretical and technological aspects of silk reeling technology. The knowledge thus gained will be helpful in distinguishing the silk fiber to that of other natural and manmade fibers, its methods and techniques of extraction the silk. This may also help them to learn the various quality parameters and standards used in testing and grading the raw silk.

(15 Hours)

Unit-I

1.1 Introduction to textile fibers, Physical and chemical properties of silk and uses of silk.
1.2 Physical and chemical properties of silk and uses of silk, Selection of cocoon for reeling
1.3 Assessment of renditta.
1.4 Processing of cocoons: Stifling-conventional and modern -techniques, steam stifling, hot air dryer, batch types and conveyor types-their advantages and disadvantages.
1.5 Sorting of defective cocoons, methods of storing and preservation of stifled cocoons.
1.6 Various methods of cocoon boiling- open-pan, three pan and pressurized cocoon boiling methods.
1.7 Cocoon brushing-hand brushing and mechanical brushing.

(10 Hours)

Unit-II

2.1 Reeling: Objectives study of yarn passages, raw silk yarn, size (denier) and its importance.
2.2 Objectives and importance of re-reeling. Skein formation and finishing, factors influencing the quality of fibers.
2.3 Brief description of Charaka, Cottage basin and multi-end reeling machines for silk reeling.
2.4 Quality of water required for reeling, Effects of water quality in silk reeling

(10 Hours)

Unit-III

3.1 Cocoon and raw silk testing and grading: Cocoon testing Methods,
3.2 Different tests for raw silk quality measurement, methods of testing.
3.3 Internationa1 and ISA standard of grading for raw silk.
3.4 Bureau of Indian Standard (BIS) of grading for raw silk.

(10 Hours)

Unit-IV

4.1 Silk throwing and weaving: Introduction and objectives of silk throwing, preparation for twisting, soaking, dressing, drying, winding and doubling.
4.2 Preparation for silk weaving: Warping, beaming, drawing and denting.

4.3 Study of power loom and handloom weaving.
4.4 Different types of fibers, fabric defects arid their uses.
4.5 Introduction to different class of dyes and chemicals used for silk dyeing.
4.6 Uses of reeling wastes in spun silk industry.

PRACTICUM (30 Hours)

1. Identification of textile fibers by physical and chemical test, microscopic examinations, flame tests and solubility test for polyester, cotton and silk
2. Water analysis- pH, total hardness, total alkalinity, electro conductivity and chlorides.
3. Study of multi end silk reeling machines- practical demonstration
4. Charka reeling and cottage basin -economic model of silk reeling unit (Demonstrative)

NOTE FOR PAPER SETTING

Examination Theory/Practical	Syllabus to be covered in examination	Time allotted for Exam	Marks
Internal Theory Assessment	50%	1 Hr & 30 Minutes	15
External Theory End Semester	100%	3 Hrs	60
Continuous assessment	-	-	10 (Based on Daily Performance only)
Final examination	-	-	15

External End Semester Theory Examination will have two sections (A & B) {Total marks 60}

Section A : Four short answer questions representing all units/syllabi i.e.,atleast one question fromeach unit. Each question shall be of 3 marks.

Section B: Eight long answer questions representing whole of the syllabi i.e.,two questions from each unit. Each question shall be of 12 marks. The candidate has to attempt 4 questions selecting one from each unit.

Internal Assessment {Total marks 15}

Fifteen (15) marks for theory paper in a subject reserved for internal assessment shall have one longanswer type question of 7 marks and four short answer type questions of 2 marks each.

Recommended Readings

1. Koshy,T.D. (2011) Silk Production and Export Management. APH Publishing Corporation, New Delhi.
2. GuoRui, H. (1998) Silk Reeling. Oxford and IBH publishing Co. Pvt. Ltd, New Delhi.
3. Vidyasagar, P.V. (2010) Encyclopedia of Textiles (five volumes). Mittal Publications, New Delhi.
4. Vidyadagar, P.V. (2008) Handbook of Textiles. Mittal Publications, New Delhi (India).
5. Mahadevappa, D. Halliyal, V.G. *et. al.,* (2000) Mulberry Silk Reeling Technology. Oxford and IBH publishing Co. Pvt. Ltd, New Delhi.
6. Sonwalker, T.N. (2001) Hand Book of Silk Technology. New Age International (P) limited, New Delhi and Mumbai.
7. Ananthanarayan, S.K. (2008) Silk Reeling. Biotech Books, Delhi.
8. Woo Lee,Y. (2005) Silkworm Reeling and Testing Manual. Daya Publishing House, New Delhi.

UNIVERSITY OF JAMMU
SYLLABI AND COURSE OF STUDY IN SERICULTURE UNDER CBCS AS PER NEP-2020
(For the Examination to be held in Year 2024, 2025 & 2026)
(MAJOR COURSE)
UG SEMESTER-IV

MAJOR CORE COURSE NO.	:	**UMJSET-404**
MAJOR CORE COURSE TITLE	:	Value Addition in Sericulture
CREDITS	:	04 (03 Theory) + (1Practicum)
MAXIMUM MARKSTHEORY	:	75
I) External Theory (University Exam)	:	60
II) Internal Assessment	:	15
DURATION OF UNIVERSITY THEORY EXAM:		03 Hours
MAXIMUM MARKS PRACTICALS	:	25
I) Continuous Assessment	:	10
II) Final Examination	:	15

Objectives and Expected Learning Outcomes

The students on successful completion of this course will be able to understand about various value-added products prepared from different wastes generated during different stages of sericulture. The students will also be able to get hands on training in the preparation of value added products from sericulture wastes. The course will also help in identify different types of wastes.

Unit-I (12 Hours)

1.1 General account of value added/by products in Sericulture
1.2 Importance and scope of Sericulture value added/by products in Sericulture
1.3 Entrepreneurship development in value added /by products of Sericulture

Unit-II (10 Hours)

2.1 Pharmaceutical value of mulberry
2.2 Mulberry leaf chemical composition
2.3 Medicinal value/pharmaceutical utility of mulberry leaf, mulberry fruit, mulberry stem and root
2.4 Value added products of mulberry: different recipes from mulberry leaf and fruit
2.5 Value added products from mulberry leaf, stem, root and fruit

Unit-III (10 Hours)

3.1 Value added products of cocoon: Silkworm rearing bed refuge for vermi compost preparation.
3.2 Silkworm larvae for human consumption-nutrition value.
3.2 Silkworm as biotechnological and laboratory tool.
3.3 Cocoon based handicrafts, defective and double cocoons for production of dupion silk.
3.4 Value added products of silk: Value adding potentials and prospects for silk

Unit-IV (13 Hours)

4.1 Types of silk wastes-spun silk, noil yarn and its utility.
4.2 Silkworm pupae as food material, pupal oil extraction and its uses.
4.3 Application silk protein fibroin and sericin as a biomaterial and other seri-by products
4.4 Pharmaceutical application-biomedical application and cosmetic application.

PRACTICUM (30 Hours)

1. Identification of wastes in different phases of Sericulture: a) Mulberry cultivation b) Silkworm rearing & seed production c) Silk reeling and weaving d) Silk cocoon handicrafts preparation
2. Demonstration on Vermicompost preparation using Sericulture waste
3. Preparation of mulberry tea using leaf
4. Mulberry jam preparation using mulberry fruit
5. Recipes from mulberry leaf

NOTE FOR PAPER SETTING

Examination Theory/Practical	Syllabus to be covered in examination	Time allotted for Exam	Marks
Internal Theory Assessment	50%	1 Hr & 30 Minutes	15
External Theory End Semester	100%	3 Hrs	60
Continuous assessment	-	-	10 (Based on Daily Performance only)
Final examination	-	-	15

External End Semester Theory Examination will have two sections (A & B) {Total marks 60}

Section A : Four short answer questions representing all units/syllabi i.e.,atleast one question fromeach unit. Each question shall be of 3 marks.

Section B: Eight long answer questions representing whole of the syllabi i.e.,two questions from each unit. Each question shall be of 12 marks. The candidate has to attempt 4 questions selecting one from each unit.

Internal Assessment {Total marks 15}

Fifteen (15) marks for theory paper in a subject reserved for internal assessment shall have one longanswer type question of 7 marks and four short answer type questions of 2 marks each.

Recommended Readings

1. Plant cell culture: A practical Approach by R. A. Dixon & Gonzales, IRL Press.
2. Mahadevappa, D. Halliyal, V.G. *et. al.,* (2000) Mulberry Silk Reeling Technology. Oxford and IBH publishing Co. Pvt. Ltd, New Delhi.
3. Sonwalker, T.N. (2001) Hand Book of Silk Technology. New Age International (P) limited, New Delhi and Mumbai.
4. http://site.iugaza.edu.ps/mwhindi/files/BIOTECHNOLOGY-PROCEDURES-AND-EXPERIMENTS-HANDBOOK.pdf
5. Web resources suggested by the teacher concerned and the college librarian including reading material

UNIVERSITY OF JAMMU
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UNDER CBCS AS PER NEP-2020
(For the Examination to be held in Year 2024, 2025 & 2026)
(MINOR COURSE)
UG SEMESTER-IV

MINOR CORE COURSE NO.	:	**UMISET-405**
MINOR CORE COURSE TITLE	:	Basics of Silkworm Crop Protection
CREDITS	:	04 (03 Theory) + (1Practicum)
MAXIMUM MARKSTHEORY	:	75
I) External Theory (University Exam)	:	60
II) Internal Assessment	:	15
DURATION OF UNIVERSITY THEORY EXAM:		03 Hours
MAXIMUM MARKS PRACTICALS	:	25
I) Continuous Assessment	:	10
II) Final Examination	:	15

Objectives and Expected Learning Outcomes

The Course has been designed with an objective to make the students familiar with various diseases and pests of mulberry silkworms as well as their control measures. The knowledge thus gained by the students shall be useful for better management in sericulture industry. Students may also be able to identify the mulberry silkworm diseases and pests that attacks mulberry silkworms during rearing.

Unit-I (13 Hours)

1.1 Introduction and classification of different types of silkworm diseases.
1.2 Influence of environment and nutrition on the incidence of diseases.
1.3 Pebrine-Symptomology, Source and mode of infection, prevention control measures.
1.4 Structure and life history of Nosema bombycis

Unit-II (10 Hours)

2.1 Flacherie-Causative agents, symptoms of different type of Flacherie diseases.
2.2 Factors influencing Flacherie, Sources, mode of infection, prevention and control measure Flacherie
2.3 Grasserie-symptoms of different types of Grasserie disease and causative agents.
2.4 Sources and mode of infection of Grasserie, Prevention and control measures of Grasserie.

Unit-III (10 Hours)

3.1 Muscardine-Symptoms of different types of Muscardine with Special reference to Beuveria.
3.2 Mode of infection, prevention and control measures of Beuveria Muscardine.
3.3 General account of disinfection and the efficacy of different disinfectants.

Unit-IV (12 Hours)

4.1 Definition of pests, parasitoids and predators.
4.2 Sampling methods of pests- economic injury level, economic threshold.

4.3 Pests of Silkworm: Life cycle, nature of damage, prevention and control measures of Techinid (Uzi) fly.
4.4 Nature of damage, prevention and control of Dermestids, ants, rodents and lizards.

(30 Hours)

PRACTICUM

1. Morphological features of Pebrine infected eggs, larvae, pupae and moths
2. Morphological features in larvae-infected by different bacteria.
3. Morphological features in larvae-infected by different viruses.
4. Examination of larvae, Pupae and moth infected with fungal diseases.
5. Practical knowledge of various chemicals used to control silkworm diseases &method of applications.

NOTE FOR PAPER SETTING

Examination Theory/Practical	Syllabus to be covered in examination	Time allotted for Exam	Marks
Internal Theory Assessment	50%	1 Hr & 30 Minutes	15
External Theory End Semester	100%	3 Hrs	60
Continuous assessment	-	-	10 (Based on Daily Performance only)
Final examination	-	-	15

External End Semester Theory Examination will have two sections (A & B) {Total marks 60}

Section A : Four short answer questions representing all units/syllabi i.e.,atleast one question fromeach unit. Each question shall be of 3 marks.
Section B: Eight long answer questions representing whole of the syllabi i.e.,two questions from each unit. Each question shall be of 12 marks. The candidate has to attempt 4 questions selecting one from each unit.

Internal Assessment {Total marks 15}

Fifteen (15) marks for theory paper in a subject reserved for internal assessment shall have one longanswer type question of 7 marks and four short answer type questions of 2 marks each.

Recommended Readings

1. Ganga, G. and Chetty, S. (2008) An Introduction to Sericulture. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
2. Ganga, G., (2003) Comprehensive Sericulture- Vol.-2 Silkworm Rearing and Silk Reeling, Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
3. Khan, Md. A., Bhat, M.M and Singh, T. (2011) Silkworm Crop Protection- Concepts and Approaches. Daya Publishing House, Delhi.
4. Singh, R.N. and Saratchandra, B. (2011) Sericultural Entomology. APH Publishing Corporation, New Delhi.

5. B. Nataraju, K Salhyaprasad *et.al.*, (2005) Silkworm crop Protection, Central Silk Board, Bangalore.
6. Aruga, H. Principles of Sericulture. Oxford and IBH Publishing Co. Pvt. Ltd. New Delhi, Bombay and Calcutta.
7. Khan, M.A., Dhar, A., Zeya, S.B and Trag, A.R. (2004) Pests and Diseases of Mulberry and their Management. Published by Bishan Singh and Mahendra Pal Singh, New Connaught Palace, Dehradun.
8. Kamili, A.S. and Masoodi, A.M. (2004). Principles of Temperate Sericulture. Kalyani Publishers, New Delhi-110002.