

**COURSE CURRICULA FOR
SERICULTURE SECTOR
UNDER
MODULAR EMPLOYABLE SKILLS (MES)**



**DIRECTORATE GENERAL OF EMPLOYMENT & TRAINING
MINISTRY OF LABOUR & EMPLOYMENT
GOVERNMENT OF INDIA**

**Course Curricula for Short Term Courses based on Modular
Employable Skills (MES) in the Sericulture Sector**

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1 - Skill Development based on Modular Employable Skills (MES)

1. a Background

Number of forums have emphasised the need for the skill development, especially for the less educated, poor and out of school youth. The skill level and educational attainment of the work force determines the productivity, income levels as well as the adaptability of the working class in changing environment. Large percentage of population in India is living below poverty line, the main reason being the lower percentage of skilled persons in the workforce. Majority of them are staying in rural India and hilly areas.

The skill development at present is taking place mostly in the informal way, i.e. persons acquire skill at the work-place when they help their parents, relatives and employers etc. Such persons do not have a formal certificate and thus earn lower wages and are exploited by employers. They have come through informal system due to socio-economic circumstances of the family and the compulsions of earning a livelihood rather than attending a formal course. While their productivity is low, their contribution to the national GDP cannot be ignored. If the country can create a system of certification which not only recognizes their skills but also provides education and training in a mode that suits their economic compulsions, it will not only benefit the workforce to earn a decent living but also contribute to the national economy by better productivity of this workforce.

Another related problem is the large number of students drop outs (About 63% of the school students drop out at different stages before reaching Class-X).

The third problem is that the industries are facing shortage of skilled people to operate the machines and produce the materials, and the skills available are not adequate considering the changing requirement of the technology.

1. b. Frame work for Skill Development based on ‘Modular Employable Skills (MES)’

Very few opportunities for skill development are available for the above referred groups (out of school youth and existing workers especially in the informal sector). Most of the existing skill development programmes are long term in nature. Poor and less educated persons cannot afford long term training programmes due to higher entry qualifications, opportunity cost etc. Therefore, new frames work for skill development for the informal sector has been evolved by the DGET to address to the above mentioned problems. The key features of the new frame work for skill development are:

- Demand driven short term training courses based on modular employable skills decided in consultation with industry.
- Flexible delivery mechanism (part time, weekends, full time)
- Different levels of programmes (Foundation level as well as skill up gradation) to meet demands of various target groups.
- Central Government will facilitate and promote training while Vocational Training Providers (VTP) under the Government and Private Sector will provide training
- Optimum utilization of existing infrastructure to make training cost effective.
- Testing of skills of trainees by independent assessing bodies who would not be involved in conducting of the training programme, to ensure that it is done impartially.
- Testing and certification of prior learning (skills of persons acquired informally)

The short term courses would be based on ‘Modular Employable Skills (MES)’.

The concept for the MES is:

- Identification of ‘minimum skills set’ which is sufficient to get an employment in the labour market.
- It allows skills up-gradation, multiskilling, multi entry and exit, vertical mobility and life long learning opportunities in a flexible manner.
- It also allows recognition of prior learning (certification of skills acquired informally) effectively.
- The modules in a sector when grouped together could lead to a qualification equivalent to National Trade Certificate or higher.
- Courses could be available from level 1 to level 4 in different vocations depending upon the need of the employer organizations.
- MES would benefit different target groups like :
 - ✓ Workers in industry and farm houses seeking certification of their skills acquired informally.
 - ✓ Workers seeking skill upgradation.
 - ✓ Early school drop-outs and unemployed.
 - ✓ Previously child labour and their family.

1. c. Age of participants

The minimum age limit for persons to take part in the scheme is 14 years but there is no upper age limit.

1. d. Curriculum Development Process

Following procedure is used for developing course curricula

- Identification of Employable Skills set in a Sector based on division of work in the labour market.
- Development of training modules corresponding to skills set identified so as to provide training for specific and fit for purpose
- Organization of modules in to a Course Matrix indicating vertical and horizontal mobility. The course matrix depicts pictorially relation among various modules, pre requisites for higher level modules and how one can progress from one level to another.
- Development of detailed curriculum and vetting by a trade committee and by the NCVT (Close involvement of employers organizations, state governments, experts, vocational training providers and other stake holders is ensured at each stages).

1. e. Development of Core Competencies

Possession of proper attitudes is one of the most important attribute of a competent person. Without proper attitudes, the performance of a person gets adversely affected. Hence, systematic efforts will be made to develop attitudes during the training programme.

The trainees deal with men, materials and machines. They handle sophisticated tools and instruments. Positive attitudes have to be developed in the trainees by properly guiding them and setting up examples of good attitudes by demonstrated behaviours and by the environment provided during training.

Some important core competencies to be developed are:

1. Safety consciousness and safe working practices
2. Care of equipment and tools

3. Punctuality, discipline and honesty
4. Concern for quality
5. Respect for rules and regulations
6. Concern for health and hygiene
7. Cordial relationship and cooperation with co-workers and team work
8. Positive attitude and behaviour
9. Responsibility and accountability
10. Learn continuously
11. Communication skills
12. Concern for environment and waste disposal

Following competencies should also be developed during level-II and higher courses:

1. Ability for planning, organizing and coordinating
2. Creative thinking, problem solving and decision making
3. Leadership
4. Ability to bear stress
5. Negotiation

1. f. 6. Duration of the Programmes

Time taken to gain the qualification will vary according to the pathway taken and will be kept very flexible for persons with different backgrounds and experience. Duration has been prescribed in hours in the curriculum of individual module, which are based on the content and requirements of a MES Module. However, some persons may take more time than the prescribed time. They should be provided reasonable time to complete the course.

1. g. Pathways to acquire Qualification:

Access to the qualification could be through:

- An approved training programme;
Or
- A combination of an approved training programme plus recognition of prior learning including credit transfer;
Or
- The recognition of prior learning that provides evidence of the achievement of the competencies for the qualification.

1. h. Methodology

The training methods to be used should be appropriate to the development of competencies. The focus of the programme is on “Performing” and not on “Knowing”. Lecturing will be restricted to the minimum necessary and emphasis to be given for ‘Hands on training’.

The training methods will be individual centred to make each person a competent one. Opportunities for individual work will be provided. The learning process will be continuously monitored and feedback will be provided on individual basis.

Demonstrations using different models, audio visual aids and equipment, and visiting the actual spot of work like farmhouses, factories, mines, hospitals etc., will be used intensively.

1. i. Instructional Media Packages

In order to maintain quality of training uniformly all over the country, Instructional Media Packages (IMPs) will be developed by the National Instructional Media Institute (NIMI), Chennai.

1. j. Assessment

DGE&T will appoint assessing bodies to assess the competencies of the trained persons. The assessing body will be an independent agency, which will not be involved in conducting the training programmes. This, in turn, will ensure quality of training and credibility of the scheme. Keeping in view the target of providing training/testing of one million persons through out the country and to avoid monopoly, more than one assessing bodies will be appointed for a Sector or an area.

1. k. Certificate

Successful persons will be awarded certificates issued by National Council for Vocational Training (NCVT).

1. l. MES courses approved by NCVT

The NCVT released a list of 340 approved courses on 15th September 2008, i.e. on the Engineers day (128th birth day of Sir. M. Visweswariah). The courses were allotted 6 digit alpha numerical codes with the following formula

From Left side:

1st, 2nd and 3rd digits –Sector Codes (Alpha Codes)

4th digit – Level Code (1 for level 1, 2 for level 2, 3 for level 3 and so on. As the level increases, the position in the industry also increases)

5th and 6th digits – Course serial number (separate series for courses at same level with in each sector)

1. m. The Sericulture Sector

Although various skills are covered in the list approved by NCVT on 15th Sep 2008, it was found that a major sector viz. Sericulture was not covered in the list.

The sericulture and silk sector are big sectors having an important role in the Indian economy and in job opportunities.

- India is the second largest producer of silk after China.
- Textile Sector, in which Silk is a part, is one of the largest employment providers in the country.
- Sericulture is the backbone for silk industry and provides employment to farmers.
- Majority of the silk produced in India is from Karnataka, and hence is a very important industry or the state. The other states having sericulture are Assam, West Bengal, Uttaranchal, Orissa, Madhya Pradesh and Maharashtra.
- Sericulture gives employment to people from rural and hilly areas.

Sericulture is a multidimensional, export-oriented, employment generating and highly remunerative agro-based activity, playing a critical role in poverty alleviation. In recent years, sericulture has shifted from subsidiary activity to main source of income generation in the country, particularly during the past 10-15 years. The sericulture activity involves mulberry leaf production - the host plant cultivation, silkworm cocoon generation - silkworm rearing and raw silk production, i.e., silk reeling and weaving, etc., and is an integration of these respective specialized activities. The cocoon production (and mulberry cultivation) activity has a very short gestation period and can be started with low initial investment. One hectare of irrigated mulberry garden would fetch about Rs.70, 000 to 80,000 as net income/year and provides gainful employment for 10-13 persons throughout the year. Since sericulture offers regular employment and income generation, it plays an important role in alleviating rural poverty effectively and thereby improving the living conditions of rural poor and also plays a key role in arrest of urban migration.

Sericulture is being practiced in all the 29 districts of the Karnataka State at present, with 77, 329 hectares of mulberry. The state has produced about 7,238 tons of raw silk out of the total raw silk production of the country (15, 610 tons) in India (2008-09, Indian Silk, Aug. 2009).

Mulberry cultivation, the input intensive agriculture and silkworm rearing are changing from traditional farming to improved farming.

Keeping in view the potential of sericulture industry in income and employment generation, necessary supportive programmes were implemented by different State Governments in the past decades facilitating horizontal and vertical expansions of the sericulture industry in the States.

It was therefore decided to form a Sectoral Skill Panel to identify the skills in sericulture sector. The panel was headed by Mr. S. J. Amalan, Director, Apex Hi-Tech Institute, Bangalore and Regional Director D.G.E&T, Ministry of Labour and Employment, Karnataka, Andhra Pradesh and Orissa and Dr. Munirajappa, Professor, Department of Studies in Sericulture / Life science, Bangalore University as vice chairman. The committee identified various skills in the sector and made proposals.

1. n. The members of the Sectoral Skill Panel for Sericulture Sector

The committee was guided by Mr. L. Nagarajamurthy, former Director of Vocational Education Government of Karnataka as an advisor and coordinated by Mr. B. Purushothama as coordinator. The members were drawn from different academic institutes, vocational teachers, research centres and progressive farmers and sericulturists.

Sr. No	Name	Official Address	Contact details - Phone and e-mail ID	Role in committee
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1	S. J. Amalan	Director, Apex Hi-Tech Institute, Bangalore and Regional Director D.G.E&T, Ministry of Labour and Employment, Karnataka, Andhra Pradesh and Orissa.	080-23378335, +(91) 0 9880361079 sjamalan@yahoo.co.in	Chairman
2	Dr. Munirajappa	Professor, Dept of Studies in Sericulture / Life science Jnanabharathi Campus, Bangalore University Bangalore 560056 Also Mulberry cultivation	9448224211 munirajappa@rediffmail.co m	Vice Chairman
3	Dr. Govindaiah	Professor, Dept of Studies in Sericulture / Life science Jnanabharathi Campus, Bangalore University Bangalore 560056	9916945253 9448616444 dr.govindaiah@rediffmail.c om	Member
4	Dr. B. M. Shekharappa	Scientist D, Sericulture Division, KSSRDI, Thalaghattapura, Kanakapura Road, Bangalore 560062 Also specialist in Silk worm rearing technology, Seed Technology and Physiology	9449064383 sekharappa@gmail.com	Member
5	Dr. R. S. Mallikarjunappa	Scientist D, Moriculture Division, KSSRDI, Thalaghattapura, Kanakapura Road, Bangalore 560062	080-26710814 greeshma.rm@gmail.com	Member
6	Dr. C. S Gururaj	Scientist B, Sericulture Division, KSSRDI, Thalaghattapura, Kanakapura Road, Bangalore 560062	9980867300 dr_gururajcs@yahoo.co.in	Member
7	Dr. V. N. Yogananda Murthy	Principal, Ganga Kaveri Institute of Science and Management, 1699 Dr. Rajkumar Road, 3rd Stage, Rajajinagar. Bangalore 560021	9880091635 yoga16@rediffmail.com	Member
8	Dr. H. L. Ramesh	Head, Dept of Sericulture, V.V. Pura college of Science, K.R. Road, Bangalore 560004	9880880926 ramesh64_hyadalu@rediffm ail.com	Member
9	M.S. Nijagunamurthy	Lecturer in Sericulture, Govt P.U. College, Gubbi, Tumukur Dist	9448748097	Member
10	H. N. Ramakrishna	Lecturer, Govt Junior College, Vijayapura, Devanahalli Taluk, Bangalore Rural Dist 562135	9845269905 jaya_hnr69@yahoo.com	Member

11	H. K. Suresh	State award winner for CRC Expert in Silk worm Chawki Rearing SLN Chawki Centre, Hittalahalli, Sidlaghatta Taluk, Chickaballapura Dist. 562105	9845685478	Member
12	K. Anjanappa	Expert in Silk worm seed production -grainage Sri Anjaneyaswamy Reshme Motte Utpadana Kendra, Bhodaguru, Malamachanahalli Post, Sidlaghatta Taluk, Chickaballapura Disr 562102	9448358835	Member
13	Mr. Rajanna	Progressive sericulturists s/o Krishnappa, Ajjawara village and post, Chickaballapura Dist,	9008022020	Member
14	Mr. H. Bhaskar	Progressive sericulturists s/o Honnaiah, Ajjawara village and post, Chickaballapura Dist,	9900905267	Member
15	Mr. S. Anand	Progressive sericulturists s/o Sri Ramiah Ajjawara village and post, Chickaballapura Dist,	9844622875	Member
16	Chandrashekar	Proprietor M/s Scientific farm supply. Opp State Bank of Mysore, Chickaballapura	9845013320	Member
17	Krishnappa	Progressive sericulturists Ajjawara village and post, Chickaballapura Dist,	9448277929	Member
18	L. Nagaraja Murthy	Former Director of Vocational Education, Government of Karnataka	91- 0- 9448633189 nagarajamurthyl@gmail.co m	Advisor
19	B. Purushothama	Consultant – QMS and Textiles B-17, Jayanthi Apartments, 13th cross, 4th Main, Malleswaram, Bangalore 560003	+(91) 0 9448864028 080-23461512 purushothama1949@yahoo. co.in	Coordinator

1. o. The Criteria

The criteria adopted for identifying the skills were as follows

- Skill required by the industry for the jobs
- Safety precautions while working
- Minimum education level for the job
- Minimum age limit for all courses – 14 Years
- Minimum time required for the course
- Course content
 - Practical aspects
 - Theory aspects
- Tools and Equipments needed

1. p Areas covered.

The following areas were covered

Modular employable skills identified for Sericulture Sector					
Level	1	2	3	4	Total
Mulberry	2	3	1		6
Rearing	4	3	4	1	12
Accessories		2			2
Stores and Despatch		2			2
Value addition	4				4
Total	10	10	5	1	26

The chapter 2 gives the skills identified in a tabular form

The Appendixes give the details of curricula and the minimum tools and equipments for training 20 candidates for each module identified

1. q. Suggestions

The committee made the following suggestions considering the practical problems in training the people for the required skills.

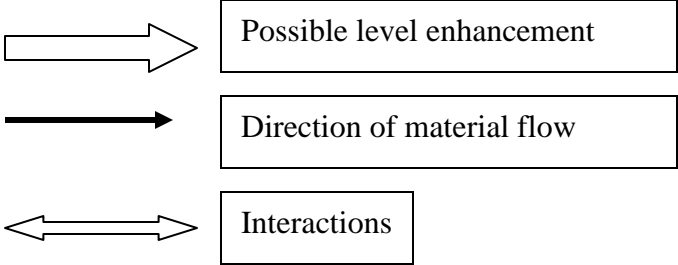
- The trainees should work like a regular employee of the industry for the full time to acquire the skills as needed by a regular worker. We need to understand that just by seeing in a practical class and listening to lectures, the skill cannot be developed.
- It shall not be practicable to any institute to have the equipments that are latest and the number of equipments or machines for each trainee to operate as they are costly and have innumerable varieties.
- As the design features are different from make to make, the operator working with certain speed on particular equipment cannot operate another equipment of different make with the same speed.
- The training should be given in regular factories or process houses by making collaborations of industry and institution. The government must coordinate with the institutes and the industry.
- The assessing bodies should test the trainees for their skill on the machines and equipment they practice and at the same environment of working.
- The committee has identified certain skills, but does not claim that all skills are covered.
- Each factory or a production unit has its own systems and the technology. The committee has tried to cover the common activities, and not the specialized one for a particular factory or an area.
- The technology is changing continuously and there is a need to revise these skills at least every 5 years.

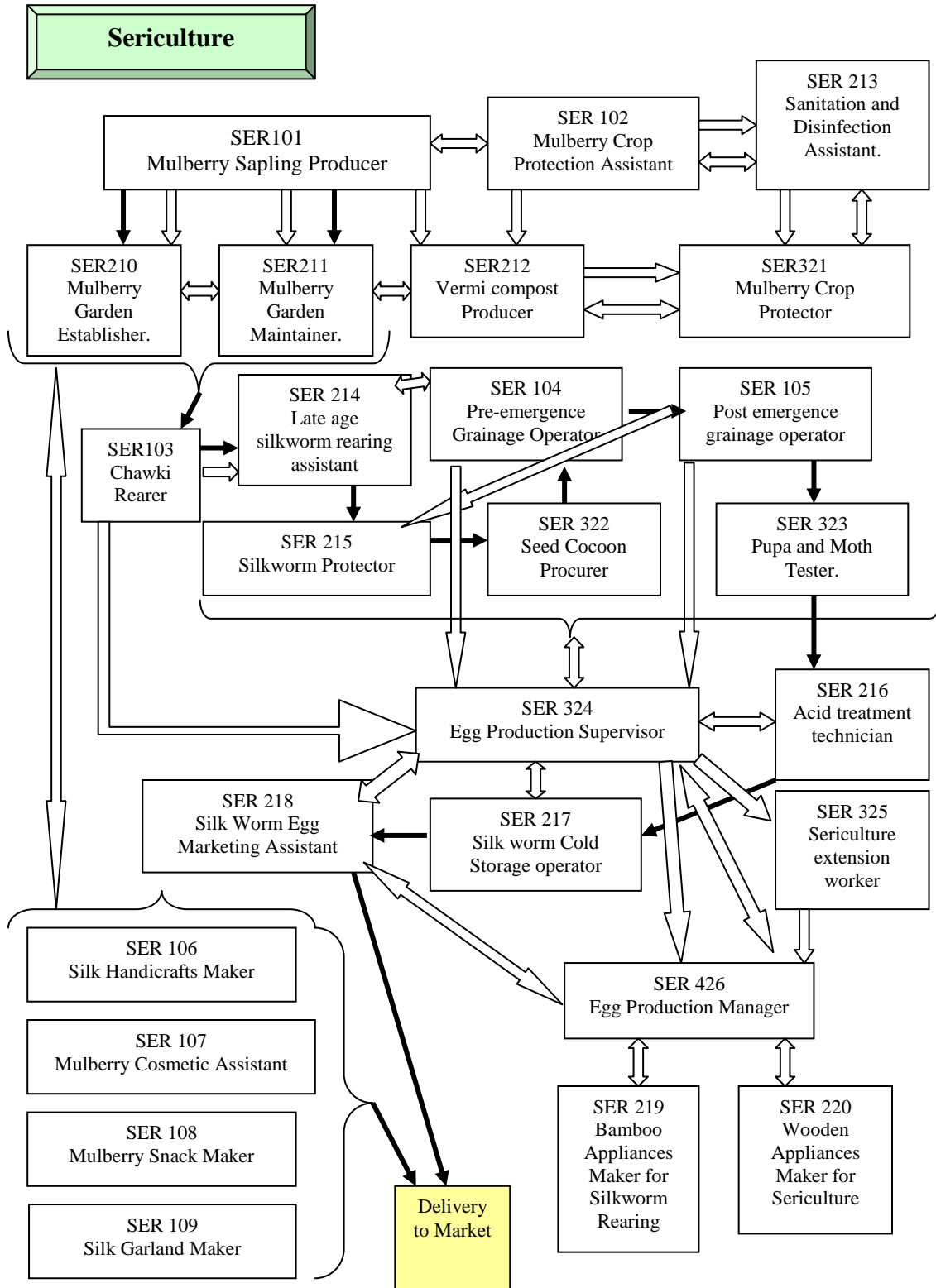
2 – Skills identified in Sericulture Sector

Sr No	Code	Level	Title	Entry Qualifications	No of hours	Group
1	SER101	1	Mulberry Sapling Producer	5th Std	200	Mulberry
2	SER210	2	Mulberry Garden Establisher.	5th Std + SER101	150	Mulberry
3	SER211	2	Mulberry Garden Maintainer.	5th Std + SER101	200	Mulberry
4	SER212	2	Vermicompost Producer	5th Std + SER101	200	Mulberry
5	SER321	3	Mulberry Crop Protector	5th Std + SER 102+ SER204	200	Mulberry
6	SER 102	1	Mulberry Crop Protection Assistant	5 th Std	150	Mulberry
7	SER 213	2	Sanitation and Disinfection Assistant.	5th Std	200	Rearing
8	SER103	1	Chawki Rearer	5th Std	150	Rearing
9	SER 214	1	Late age silkworm rearing assistant	5th Std + SER 103	200	Rearing
10	SER 215	2	Silkworm Protector	5th Std + SER105	200	Rearing
11	SER 322	3	Seed Cocoon Procurer	10th Std	150	Rearing
12	SER 104	1	Pre-emergence Grainage Operator	5th Std	150	Rearing
13	SER 105	1	Post emergence grainage operator	5th Std	150	Rearing
14	SER 323	3	Pupa and Moth Tester.	10th Std	150	Rearing
15	SER 216	2	Acid treatment technician	10th Std	150	Rearing
16	SER 217	2	Silk worm Cold Storage operator	10th Std	150	Stores/Despatch
17	SER 218	2	Silk Worm Egg Marketing Assistant	10th Std + basic computer knowledge	150	Stores/Despatch
18	SER 324	3	Egg Production Supervisor	10th Std + SER103 + SER104 + SER105	150	Rearing
19	SER 426	4	Egg Production Manager	10th Std + SER304	150	Rearing
20	SER 325	3	Sericulture extension worker	10 ^h Std + SER 304	150	Rearing
21	SER 219	2	Bamboo Appliances Maker for Silkworm Rearing	5th Std	200	Accessories
22	SER 220	2	Wooden Appliances Maker for Sericulture	5th Std	200	Accessories
23	SER 106	1	Silk Handicrafts Maker	5th Std	150	Value Addition
24	SER 107	1	Mulberry Cosmetic Assistant	5th Std	150	Value Addition
25	SER 108	1	Mulberry Snack Maker	5th Std	150	Value Addition
26	SER 109	1	Silk Garland Maker	5th Std	150	Value Addition

**Matrix
Sericulture
Mulberry – Rearing – Stores Despatch – Accessories – Value Addition**

The Matrix is prepared to indicate the possible level enhancement for the candidates, direction of material flow and the interactions. Following symbols are used.





Course Curricula

Practical competencies	Under pinning knowledge (Theory)
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LEVEL – 1

- 1. Module Name:** Mulberry Sapling Producer
- 2. Sector:** Sericulture
- 3. Code:** SER - 101
- 4. Entry Qualification** Minimum 5th Standard and 14 years of age
- 5. Terminal Competency:** The successful candidate would be able to raise mulberry saplings for commercial purposes.
- 6. Duration:** 200 hours
- 7. Preface:** Mulberry is vegetatively propagated through stem cuttings. The cuttings are directly planted in the main field and some time nursery is raised. Due to direct planting of cuttings in main field the mortality of cuttings ranges from 30% - 40%. The use of saplings ensures quick establishment and uniform growth of plants. Therefore, saplings have to be used as planting materials instead of cuttings.
- 8. Job Profile** Employable in Kisan Nurseries and self-employment.

9. Course Content:

➤ Selection of suitable nursery site	➤ Methods of propagation.
➤ Treat the soil with furadon to ensure nematode free plot.	➤ Types of nursery beds (sunken and raised), season/time of raising nursery.
➤ Preparation of land, measurement and markings of beds and furrows as per the recommendations and types. Determination of the quantity of cuttings required.	➤ Knowledge about popular mulberry varieties.
➤ Preparation of propagation mixture (red soil, sand and FYM to make 1:1:1 ratio) and application.	➤ Vegetative propagation of mulberry and its advantages.
➤ Selection of popular mulberry variety.	➤ Selection of suitable nursery site – assured irrigation, disease free soil.
➤ Selection of shoots and preparation of cuttings with 3 to 4 active buds; identification of active and deformed buds.	➤ Preparation of nursery beds – digging, leveling, weeding, cleaning etc.
➤ Treatment of cuttings with fungicide	➤ Preparation of propagation mixture

solutions, and root hormones.	(red soil, sand and FYM
➤ Application of bio-control agents and soil application of VAM.	➤ Application of organic manures – FYM/ compost/ vermicompost.
➤ Planting of cuttings – spacing, soil depth, number of cuttings per bed.	➤ Selection of shoots and preparation of cuttings; length of cuttings, number of active buds/cutting.
➤ Maintenance of nursery beds. Irrigation – use of rose cans, micro sprinkler, weeding, application of fertilizers etc.	➤ Treatment of cuttings with fungicide, root hormones, VAM and their importance.
➤ Plant protection measures – spray of fungicides and pesticides for control of pests and diseases in nursery.	➤ Planting of cuttings – methods and spacing.
➤ Uprooting, packing and transportation of mulberry saplings.	➤ Maintenance of nursery - irrigation, manuring, weeding, protection, etc.
➤ Safety measures while using cutting implements, pesticides and chemicals and practice of first aid.	➤ Uprooting, packing and transportation of mulberry saplings with care

10. Tools and equipments required for a batch of 20 trainees.

1.	Suitable nursery site	5 beds of 2.4 x 1.2 m (8 x 4 ft)
2.	Garden implements - Crowbar, pickaxe, spade, machete, sickle, digger, rose can, hose pipe (30 mt.), plastic pot, micro sprinkler, iron pan and plastic basket	5 each
3.	Farm yard manure, red soil, sand and chemical fertilizers.	As required
4.	Planting material – stem cuttings	As required
5.	Fungicide – Diathane M ₄₅ / Bavistin, furadon	100 g
6.	Insecticide - Nuvan	100 g
7.	Root promoting hormone – IAA /IBA/commercial formulation	10ml
8.	Plastic basin – 20 lt. capacity	6 No.

9.	Biocontrol agent and VAM	5 kg each
10	Knapsack Sprayer 16 lt	1 No.
11	Gunny cloth	10 mt
12	Nylon rope	100 mt
13	Measuring tape – 50 mt.	1 no.
14	Measuring jar – 100 ml plastic	2 no.
15	First Aid kit	1 set

LEVEL - 1

- 1. Module Name:** **Mulberry Crop Protection Assistant**
- 2. Sector:** Sericulture
- 3. Code:** **SER - 102**
- 4. Entry Qualification** Minimum 5th Standard and 18 years of age
- 5. Terminal Competency:** After the completion of the course, the successful candidate would be able to assist in the control of pests and diseases of mulberry
- 6. Duration:** 120 hours
- 7. Preface:** Mulberry is affected by number of pests and diseases through out the year and the leaf yield loss is about 20% - 30%. Affected leaves are poor in the nutrition which affects the silkworm growth, cocoon production and silk quality. There fore plant protection is very important in mulberry cultivation.
- 8. Job Profile:** Employable in plant protection clinics. self entrepreneur

9. Course Content:**Practical competencies**

- Identification of pests and diseases of mulberry.
- Observation on the symptoms of pests and diseases attack.
- Control of pests and diseases by cultural methods - practicing of field sanitation, soil solarisation, manuring, flooding, mulching, intercropping and weeding.
- Observation on the symptoms of pests and diseases attack.
- Control of pests and diseases by cultural methods - practicing of field sanitation, soil solarisation, manuring, flooding, mulching, intercropping and weeding.
- Control of pests and diseases using fungicides and pesticides - Preparation of spray solution, method of spraying, handling of sprayers and maintenance, precaution during

Under pinning knowledge (Theory)

- Introduction to Pest and disease problem in mulberry.
- General account on pests and diseases of mulberry and their identification based on symptoms.
- Favourable weather conditions for pests and diseases out break.
- General account on pests and diseases of mulberry and their identification based on symptoms.
- Favourable weather conditions for pests and diseases out break.
- Management of pests and diseases by cultural, chemical and biological methods.

spraying, safe period, safe disposal of chemical containers, personal safety.

LEVEL – 1

- Control of pests and diseases using biocontrol agents - procurement of useful microbes, predators and parasitoids, method of application, precaution while handling the biocontrol agents.
- Residual toxicity of fungicides and pesticides.
- Precautionary measures to be taken during spraying and handling of biocontrol agents.

10. Tools and equipments required for a batch of 20 trainees.

1.	Mulberry plot affected by pests and diseases	As required
2.	Knapsack sprayers	2 No.
3.	Bucket and Mug	4 No. each
4.	Fungicides – Diathane M-45, Bavistin,	100 g each
5.	Streptocycline	100 g
6.	Insecticides - Nu van	100 ml each
7.	Biocontrol agents (<i>Trichoderma</i> , lady bird beetle, <i>Trichogramma chilonis</i>)	As required
8.	Masks	20 No.
9.	Hand Gloves	20 Pairs
10.	Hand Lens	2 No.
11.	Polythene covers	1 Kg
12.	Garden implements – Weeding Sickle, spade, pickaxe, and digger.	5 No. each
13.	Mulberry plot affected by pests and diseases	As required
14.	Knapsack sprayers	2 No.
15.	Bucket and Mug	4 No. each

- 1. Module Name:** Chawki Rearer
- 2. Sector:** Sericulture
- 3. Code:** SER - 103
- 4. Entry Qualification** Minimum 5th Standard and 14 years of age
- 5. Terminal Competency:** The successful candidate will be capable of undertaking chawki rearing and work in chawki rearing center.
- 6. Duration:** 150 hours
- 7. Preface:** The rearing of young age silkworm up to second moult is called chawki rearing. Rearing of young age Silkworms under ideal environmental conditions, feeding succulent, nutritious, tender leaves will make the larvae grow robust and make more stress tolerant during the late age rearing. Scientifically grown chawki will result in best performance in cocoon production. Therefore, skill development in chawki rearing is an important module.
- 8. Job Profile** Employable in Chawki Rearing Centers (CRCs) and may be self employed.

9. Course Content:

Practical competencies	Under pinning knowledge (Theory)
➤ Cleaning of rearing room and appliances.	➤ Introduction to chawki rearing.
➤ Preparation of disinfectants.	➤ Chawki rearing room and rearing equipments
➤ Disinfection of Chawki rearing room and appliances.	➤ Preparation for chawki rearing for required number of Dfls.
➤ Transportation of eggs.	➤ Knowledge about disinfectants and disinfections.
➤ Practicing different types of Incubation.	➤ Method of Incubation and black boxing.
➤ Practicing black boxing.	➤ Brushing methods.
➤ Brushing and preparation of Chawki bed.	➤ Chawki rearing methods including isolation chamber and wrap up methods.
➤ Selection, harvesting and preservation of quality leaves. Practicing the chopping of leaves to required size.	➤ Importance of environmental conditions like light, air temperature and humidity and their manipulation.
➤ Bed spacing, Bed cleaning using nets and moulting care.	➤ Bed Spacing, chopping of mulberry leaves, feeding, bed cleaning, moulting and care during moult.
➤ Practicing of rearing in isolation chamber and wrap up method.	➤ Use of lime and bed disinfectants.
➤ Maintenance of optimum temperature and humidity during rearing and moulting.	➤ Concept of measuring volume area and weight.
➤ Identification of moulting and out of moult larvae.	➤ Concept of chawki garden, leaf quality, harvest and preservation.
➤ Identification of healthy, diseased and unequal worms.	➤ Leaf chopping machine and duster.

➤ Practicing the use of lime powder and bed disinfectants	➤ Care during transportation of chawki worms.
➤ Personal and rearing hygiene.	➤ Care while handling the disinfectant.
➤ Packing of chawki worms for transportation.	➤ Diseases in chawki and their control.
➤ Safety measures and First aid.	➤ Safety practices in chawki rearing.

10. Tools and equipments required for a batch of 20 students. (25 Dfls / 2 students)

1	Chawki rearing room with ante room and preparation room and corridor	
2	Chawki rearing trays (Plastic) (2' x 3')	60 No.
3	Chawki rearing bottom Stand	06 No.
4	Ant wells	36 No.
5	Chopping board and knife	05 Sets
6	Feeding stand	05 No.
7	Foot cleaning tray	03 No.
8	Wash basin	04 No.
9	Sprayer and mask	01 Set
10	Egg transportation box & Egg incubation chamber	02 unit
11	Black boxes	20 No.
12	Leaf baskets	10 No.
13	Earthen pots	5 No.
14	Foam rubber	30 strips
15	Paraffin paper	60 meters
16	Wet and dry bulb thermometer	03 No.
17	Room heater with thermostat	02 No.
18	Air cooler	01 Unit
19	Chop sticks	25 pairs
20	Feather	25 No.
21	Nylon bed cleaning nets, 2 mtr squares	60 No.

22	Measuring jars (Plastic) – 500 ml	02 No.
23	Napkin	20 No.
24	Leaf mat (Bamboo)	02 No.
25	Black colour cloth	10 Meters
26	Plastic bucket and mug, litter basket	02 Unit
27	Plastic basin	10 No.
29	Kora cloth, muslin cloth	05 meter each
30	Plastic box with lid (5 kg) , different colour	05 No.
31	Isolation chamber	02 no.
32	Hygrometer	03 no.
33	Sieve for dusting	02 no.
34	Magnifying glass with illumination	10 no.
35	Student microscope	2 no.
36	Slides and cover slips	3 boxes
37	Leaf chamber	1 no.
38	Rearing stand (double)	2 no.
39	Loose egg frames	15 no.
Rearing consumables		
1	Silkworm eggs	150 dfls sheet eggs/100 dfls loose eggs
2	General disinfectants	5 lts
3	Bleaching powder	5 kg
4	Lime powder	5 kg
5	Old news paper	5 kg

LEVEL – I

- 1. Module Name:** Pre-emergence Grainage Operator
- 2. Sector:** Sericulture
- 3. Code:** SER - 104
- 4. Entry Qualification** Minimum 5th Standard and 14 years of age
- 5. Terminal Competency:** The successful candidate would be able to separate male and female cocoons, preservation of cocoons/pupae and synchronization of male and female moths.
- 6. Duration:** 150 hours
- 7. Preface:** Preservation and sexing of cocoons/pupae and preservation of seed cocoons is an important activity to produce quality silkworm eggs. Therefore, development of skill is important in the pre-emergence grainage operations.
- 8. Job Profile:** Employable In silkworm grainage and self employable

9. Course Content

Practical Competencies	Under Pinning Knowledge (Theory)
➤ Identification of different silkworm races used in egg preparation.	➤ Knowledge about the races used in the grainage
➤ Deflossing and sorting of seed cocoons	➤ Principles of separation of male and female cocoons/pupae and their preservation.
➤ Selection of places to store different seed cocoons.	➤ Storing bivoltine and multivoltine seed cocoons separately in the grainage.
➤ Learning the method of fixing the weight of male and female cocoons of the given lot.	➤ Care during preservation of seed cocoons and pupae.
➤ Identification of male and female cocoons based on cocoon colour in sex linked breeds.	➤ To learn the need for separate emergence room for BV and MV seed cocoons.
➤ Practicing weighing of cocoons and segregation of male and female cocoons.	➤ Sexing based on cocoon weight, colour and larval markings.
➤ Skill to use exhaust fan, wet and dry thermometer, hygrometer, thermo hygograph, heater /cooler, humidifier etc., in grainage.	➤ Principle of fixing weight of male and female cocoons of a given lot.
➤ Practicing cocoon cutting for easy	➤ Basic knowledge about cocoon

emergence of moth	weighing balance and weighing measures.
➤ Preservation of male and female cocoons/ pupae separately.	➤ Synchronization and emergence of male and female moths.
➤ Learning the synchronization and emergence of male and female moths.	➤ Eco friendly disposal of wastes.
➤ Safety practices in grainage operation against use of grainage equipments. Precaution to avoid dust and scale allergy,	➤ Importance of cleanliness and personal safety. Fire fighting and first aid.
➤ Eco friendly disposal of wastes materials.	
➤ Discipline and punctuality.	

10. Tools, equipments and chemicals required for a batch of 20 students.

1.	Electronic top loading balance	1 No.
2.	Cocoon preserving plastic trays (2' x 3')	25 No.
3.	Moth Preservation Trays (plastic/metal: 12" x 8")	30 No.
4.	Deflossing Machine	1 No.
5.	Room Heater with thermostat	5 No.
6.	Humidifiers with humidistat	2 No.
7.	Cocoon preservation stands with ant wells	5 No.
8.	Wall clock	1 No.
9.	Refrigerator 300 lt capacity	2 No.
10.	Magnifying lens	5 No.
11.	Wet and Dry Thermometer	2 No.
12.	Hygrometer	2 No.
13.	Thermo hygrograph	2 No.

14.	Heater/Cooler	2 No.
15.	Blades	25

LEVEL - 1

- 1. Module Name:** Post emergence grainage operator
- 2. Sector:** Sericulture
- 3. Code:** SER - 105
- 4. Entry Qualification** Minimum 5th Standard and 14 years of age
- 5. Terminal Competency:** The successful candidate would be able to carry out works starting from moth emergence to egg laying and packing.
- 6. Duration:** 150 hours
- 7. Preface:** The silkworm moth emergence and preparation of eggs are important activities in grainage to produce quality eggs. Therefore, development of skill is a pre-requisite for quality eggs production.
- 8. Job Profile:** Employable In silkworm grainage and self employable

9. Course Content

Practical Competencies	Under Pinning Knowledge (Theory)
➤ To use safety gadgets during moth emergence.	➤ Importance of light and dark condition during moth emergence and pattern of male and female moth emergence.
➤ Use of light in moth emergence. Identification of male and female moths, separation and preservation.	➤ Knowledge about the difference in male and female pupae and moths.
➤ Practice of maintenance of temperature, humidity, light and other conditions during oviposition	➤ Knowledge about hybrid egg production.
➤ Preparation of starch paper for loose egg preparation.	➤ Knowledge of parents involved in crossing, mating/pairing, depairing, placing female moth for egg laying and male moth preservation.
➤ Skill to use cellule, hygrometer, egg laying paper, starch paper and loose egg preparation, news paper.	➤ Principle and scope of sheet and loose egg preparation – Advantages and disadvantages.
➤ Labeling and preservation of moths	➤ Environmental conditions during emergence, pairing, oviposition and oviposition room.
➤ Pairing of male and female moths.	➤ Silk moth scale and its impact on human health.
➤ Depairing and placing the female for egg laying in cellule/on starch paper	➤ Safe disposal of grainage wastes.

tray.	
➤ Processing egg sheets and starched for sheet egg and loose eggs.	
➤ Surface disinfection of egg using 2% formalin.	
➤ Dispatching the eggs for incubator/cold storage and acid treatment.	
➤ Discipline and punctuality.	
➤ Dispatch of female moths for testing	
➤ Safety practices in grainage operation against use of grainage equipments. Precaution to avoid dust and scale allergy,	

10. Tools, equipments and chemicals required for a batch of 20 students.

1.	Cocoon preserving plastic trays (2' x 3')	25 No.
2.	Moth Preservation Trays (plastic/metal: 12" x 8")	30 No.
3.	Wash Basin	2 Nos.
4.	Mask and Gloves	1 Set.
5.	Room Heater with thermostat	2 Nos.
6.	Humidifiers with humidistat	1 Nos.
7.	Alarm time piece	1 No.
8.	Cellules	250 No.
9.	Thermometer	5 Nos.
10.	Refrigerator 300 lt capacity	1 Nos.
11.	Emergency solar lamp	3 No.
12.	Diesel Generator Set	1 No.
13.	Egg Sheet	500 sheets
14.	Egg Cabinet	1 No.

15.	Calulator	5 No.
16.	Thermo-hygrograph	2 No.
17.	Magnifying lens	5 No.
18.	Starch	10 Kg.
19.	Measuring jar 250 ml Plastic	2 No.
20.	Hot Plate	1 No.
22.	Loose egg box	25 No.
23	Aluminium vessel with spoon (5 lt capacity)	1 No.
24	Face Mask	25 No.

LEVEL –1

1. Module name	Silk Handicrafts Maker
2. Sector	Sericulture
3. Code	SER 106
4. Entry Qualification	Minimum 5th standard and 14 years of age
5. Terminal competency	Successful candidate would be able to produce silk handicrafts like greeting cards, bouquets, toys, dolls, wall hangings and decorative items from cut cocoons, waste silk, silk cloth and paper.
6. Duration	150 hours
7. Preface	Cocoons and silk are very good materials to make beautiful handicrafts like greeting cards, bouquets, flower cuttings, wall hangings etc. This work involves colouring the raw materials, designing the handicraft and actual preparation. Since this involves skill and creativity there is a scarcity of skilled manpower, Therefore, this module will help to develop the skill.
8. Job Profile	Employable in cottage industries or self employed.

9. Course Content:

Practical Competencies	Underpinning Knowledge(Theory)
GENERAL A) Safety Precautions <ul style="list-style-type: none"> ➤ Safety working methods with blades, threads, needles and scissors. ➤ Practice good housekeeping. ➤ Basics of First Aid B) Professional ethics <ul style="list-style-type: none"> ➤ Obedience and punctuality. ➤ Importance of personnel safety. APPLICATION <ul style="list-style-type: none"> ➤ Safe handling cutting tools like blades threads, needles and scissors. ➤ Plant Layout & Working ➤ Material Handling ➤ Preparing silk handicrafts (list enclosed) 	<ul style="list-style-type: none"> ➤ Importance of safety of during production of silk handicrafts. ➤ Protective clothing and equipments ➤ First aid for minor cuts; foreign body in eye etc. ➤ Basic of hygiene, personal hygiene. ➤ Desirable qualities of good human relationship. ➤ Importance of time & communication Skills. ➤ Types of greeting cards, wall hangings, bouquets, toys, dolls, and decorative items that can be produced using cut cocoons,

<ul style="list-style-type: none"> ➤ Types of scissors and methods of using them. <p>PROCESSING</p> <ul style="list-style-type: none"> ➤ Identification of the layout. ➤ Methods to maintain and store raw materials like cut cocoons, silk and other required materials ➤ Procurement of quality raw materials, colours, threads, paper and methods of storing. ➤ Different types of greeting cards. ➤ Methods of colouring cocoons and silk. ➤ Mixing of dyes. ➤ Prepare different types of toys, dolls and decorating items ➤ Maintenance of inventory and book keeping. ➤ Packing of products in suitable boxes so as to maintain quality. ➤ Sale of products ➤ Market survey and identification of suitable markets for sale of products. 	<ul style="list-style-type: none"> ➤ waste silk and silk cloths. ➤ Methods of making handicrafts. ➤ Maintenance of accounts and books.
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10. Tools and Equipments to train 20 candidates per batch

Sl. No.	Item	
1	Scissors – standard type.	20 no
2	Scissors – zig zag cutting type.	20 no
3	Scissors – bent type.	20 no
4	Steel blades.	5 doz
5	Twine threads	50 rolls
6	Nylon threads	50 rolls
7	Tange wire	2 kg
8	Dye stuff – 100g per colour, basic colours	100 g
9	Plastic crates (2' x 3').	10 no
10	Sealing machine.	02 no
11	Weighing scale (electronic weighing scale) (10 – 1000g capacity).	02 no
12	Plastic bins 2' x 1.5' x 1.5' h.	5 no
13	Working tables	4 no
14	Measuring scale	10 no
15	Sewing needles – assorted size	20 sets
16	Steel containers for dyeing the cocoons and silk	10 no
17	Plastic drums for cut cocoon storing	10 no
18	Vacuum cleaner.	1 no
19	Garland decorative materials like colour papers, colour	As needed

	strips, etc.	
20	Fevicol	As needed
21	Satin Ribbon	20 rolls
22	Satin flowers	As needed
23	Chamble	As needed
24	Rivets for bags	As needed
25	Cellophane Tape	20 rolls
26	Packing materials like, polythene covers, paper covers, etc.	As needed
27	Reege	As needed
28	Handicraft Decorative Mix	As needed
29	Clipper	As needed
30	Cutters	As needed
31	Hand made paper boards	As needed
32	Recycled paper	As needed
33	Glitter tubes	As needed
34	Land Board	As needed

LEVEL – 1

1. Module name	Mulberry Cosmetic Assistant
2. Sector	Sericulture
3. Code	SER 107
4. Entry Qualification	Minimum 5th standard and 14 years of age
5. Terminal competency	After completion of this level the trained person would be having the basic skill of the production of mulberry based cosmetic materials
6. Duration	150 hours
7. Preface	Mulberry leaves and fruits have several useful chemicals and molecules having cosmetic value for humans. Preparation of cosmetic products from mulberry will be an important economic activity increasing the income per unit area of garden.
8. Job Profile	The trained person can be employable in cosmetic manufacturing factories, cottage industries and self-employment.

9. Course Content:

Practical Competencies	Underpinning Knowledge(Theory)
<p>GENERAL</p> <p>A) Safety Precautions</p> <ul style="list-style-type: none"> ➤ Safety working procedures and the necessary precautions. To handle steam; LPG; electrical; mixing and grinding equipments. ➤ Practice good housekeeping like preventing misuse of raw materials and end products. ➤ Practice of First Aid <p>B) Washing and Sanitation</p> <ul style="list-style-type: none"> ➤ Procedure for hand washing and personal hygiene. ➤ Sanitization of equipments and workplace (before and after work) <p>C) Professional ethics</p> <ul style="list-style-type: none"> ➤ Obedience and punctuality. ➤ Adhering to regulations like not using banned colours, chemicals, verifying the expiry dates, and purity of the ingredients. ➤ Follow statutory instructions. 	<ul style="list-style-type: none"> ➤ Types of cosmetic products form mulberry. ➤ Desirable qualities of good human relationship. ➤ Importance of time & communication Skills. ➤ Importance of safety of use of cosmetic products. ➤ Importance of safe handling of mixing and grinding equipments; diesel/gas furnaces; steam kettles etc. ➤ Protective clothing and equipments ➤ First aid for burns steam/oil/ electrical; minor cuts; safety of eye, etc. ➤ Basic of Personal and product hygiene. ➤ Importance of hand washing and sanitation in ensuring health and safety of workers while handling chemicals.

<p>APPLICATION</p> <ul style="list-style-type: none"> ➤ Safe handling of pulverizers, mixers, cutting implements and grinders; gas; furnaces; steam kettles etc. ➤ Use of protective clothing and equipments. ➤ Reading of Plant Layout & Working ➤ Preparation of cosmetic products by cooking, mixing/blending and distilling. <p>A) Principles and Processing</p> <ul style="list-style-type: none"> ➤ Preservation and storing of raw materials, equipments and surroundings to meet standards. ➤ Harvesting suitable quality of mulberry leaves from suitable mulberry variety. ➤ Preparation and preservation of mulberry leaf powder. ➤ Cleaning and storing raw materials/ ingredients. ➤ Prepare different cosmetic items as per the standard recipe (list of cosmetic products of commercial value are enclosed). ➤ Practicing different methods of packing of cosmetics to improve shelf life and safety of the products. ➤ Maintenance of inventory and bookkeeping. 	<ul style="list-style-type: none"> ➤ Basics of mulberry cultivation method, package of practice, harvesting of mulberry leaves and fruits and their preservation. ➤ Drying and powdering of mulberry leaves. ➤ Types of cosmetic products that can be produced using mulberry leaves and fruits. ➤ Recipe of the cosmetic products and packing methods for long-term preservation and transportation. ➤ Disposal of wastes.
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List of cosmetic products from mulberry leaves and fruits of commercial value:

Mulberry hair oil (2 types), Mulberry hair conditioner, Mulberry hair pack, Mulberry face pack, Mulberry body scrubber, Mulberry soap nut powder.

10. Tools and Equipments to train 20 candidates per batch

Sl. No.	Item
1	LPG stove with LPG cylinders 3 sets
2	Electric hot plate – 02 no.
3	Mini pulveriser - 01
4	Refrigerator (300 lt. capacity) – 01 no.
5	Commercial powder mixers -1
6	Weighing scale (electronic weighing scale) (10 – 1000g capacity) – 02 no.
7	Working tables (4' x 12') – 4 no.
8	Plastic crates (2' x 3') – 20 no.
9	Sealing machine – 02 no.
10	Plastic drum – 5 no.
11	Oil drums (50 lt. capacity) – 5 no.
12	Measuring Jar-2

13	Frying Pan-2
14	Filling Machine-2
15	Packing materials like, bottles for hair oil, polythene covers etc.
16	Powder storing air tight containers (10 kg capacity) – 10 no.
17	Steel dabara big size (24" dia) – 06 no.
18	Steel dabara small size (12" dia) – 06 no.

LEVEL –1

1. Module name	Mulberry Snack Maker
2. Sector	Sericulture
3. Code	SER 108
4. Entry Qualification	Minimum 5th standard and 14 yrs of age
5. Terminal competency	Successful candidate would be able to produce marketable edible products from mulberry leaves and fruits. Person would be having the basic knowledge of the cooking, food safety and processing
6. Preface	Mulberry leaves and fruits are a good source of proteins, carbohydrates, vitamins and natural minerals. Therefore, healthy food products can be prepared and marketed giving the consumers a good choice
7. Duration	150 hours
8. Job Profile	Employable in edible product's cottage industries, Self-employment

9. Course Content:

Practical Competencies	Underpinning Knowledge(Theory)
<p>GENERAL</p> <p>A) Safety Precautions</p> <ul style="list-style-type: none"> ➤ Safety working procedures and the necessary precautions. ➤ Handling steam; LPG; electrical; micro oven, conduction cooker, cutting and grinding equipments. ➤ Practice good housekeeping like preventing misuse of raw materials and end products. ➤ Practice of First Aid <p>B) Washing and Sanitation</p> <ul style="list-style-type: none"> ➤ Procedure for hand washing and personal hygiene. ➤ Sanitization of equipments and workplace (before and after work) <p>C) Professional ethics</p> <ul style="list-style-type: none"> ➤ Obedience and punctuality. 	<ul style="list-style-type: none"> ➤ Importance of food safety ➤ Importance of safe handling of cutting and grinding equipments; diesel/gas furnaces; steam kettles etc. ➤ Protective clothing and equipments ➤ First aid for burns steam/oil/ electrical); minor cuts; foreign body in eye etc. ➤ Basic of Hygiene, Personal hygiene. ➤ Importance of hand washing and sanitation in ensuring food safety quality along with health of workers. ➤ Desirable qualities of good human relationship.

<ul style="list-style-type: none"> ➤ Importance of food safety. <p>APPLICATION</p> <ul style="list-style-type: none"> ➤ Safe handling cutting and grinding equipments; gas; furnaces; steam kettles etc. ➤ Protective clothing and equipments. ➤ Basics of Material Handling ➤ Basic Method of Cooking <p>PROCESSING</p> <ul style="list-style-type: none"> ➤ Identification and weighing/measuring of various raw materials used in making different snacks (list enclosed). ➤ Maintenance of equipments and surroundings to meet the food standards. ➤ Prepare mulberry leaves from suitable mulberry variety and quality. ➤ Preserving the mulberry powder to maintain food quality. ➤ Cleaning and storing raw materials/ ingredients to maintain quality. ➤ Prepare different food items as per the standard recipe (list of food products of commercial value are enclosed). ➤ Practicing different methods of packing to improve shelf-life and safety of the products. ➤ Maintenance of inventory and bookkeeping. ➤ Safe transportation. 	<ul style="list-style-type: none"> ➤ Importance of time & communication Skills. ➤ Mulberry cultivation method, package of practice. ➤ Method of harvesting of mulberry leaves and fruits. ➤ Drying and powdering of mulberry leaves. ➤ Types of edible products that can be produced using mulberry leaves and fruits. ➤ Recipe of the food products. ➤ Maintenance of inventory/accounts and books.
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List of food products from mulberry leaves and fruits of commercial value:

Mulberry Papad (2 types), Mulberry Khakra, Mulberry sweet biscuits, Mulberry chilli biscuits, Mulberry Poustika Chapathi Mix, Mulberry Tomato Soup Mix, Mulberry Corn Soup Mix, Mulberry Fruit Cake, Mulberry Fruit Churna, Mulberry fruit Balaka, Mulberry Fruit Syrup, Mulberry Fruit Preserve and Mulberry pickles.

10. Tools and Equipments to train 20 candidates per batch

Sl.No.	Item	
1	LPG stove with LPG cylinders	05 Set
2	Electric hot plate	02 no.
3	Refrigerator (300 lt. capacity)	01 no

4	Mini pulveriser	01 no
5	Mini fruit pulper	01 no
6	Papad making machine (Leg operated)	02 no
7	Mixer grinder.	01 no
8	Weighing scale (electronic weighing scale) (10 – 1000g capacity).	02 no
9	Bakery oven (to be constructed using brick and mortar)	01 no.
10	GI trays (2' x 3').	10 no
11	Chapathi making wooden boards with rollers.	10 no
12	Working tables (4' x 12').	4 no
13	Sealing machine.	02 no
14	Plastic crates (2' x 3').	50 no
15	Biscuit cutter .	12 no
16	Plastic water drum	02 no
17	Pressure Cooker	02 no
18	Thick bottom aluminium vessel (24" dia).	03 no
19	Stainless steel serving and packing spoons.	10 no
20	Jalara	02 no
21	Sieves	02 no
22	Kitchen Knife.	10 no
23	Plastic food grade storing containers (10 kg capacity).	12 no
24	Measuring Jar.	02 no
25	Dry fruit cutter/slicer.	05 no
26	Dabbara	02 no
27	Steel dabara small size (12" dia).	06 no
28	Steel dabara big size (24" dia).	06 no
29	Milk Chiller	01 no
30	Milk Boiler	01 no
31	Frying Pan	02 no
32	Steel Laddles	04 no
33	Masala Drum	01 no
34	Fryer	01 no
35	Tongs	02 no
36	Filling Machine	02 no
37	Bamboo/grass floor mats.	06 no

LEVEL –1

1. Module name	Silk Garland Maker
2. Sector	Sericulture
3. Code	SER 109
4. Entry Qualification	Minimum 5th standard and 14 years of age
5. Terminal competency	Successful candidate would be able to produce silk garland from cut cocoons and waste silk.
6. Duration	150 hours
7. Preface	Garlands from waste cocoons and silk is a value added product having good demand both in the domestic and export market. This is a highly skilled job demanding craftsmanship and creativity. Therefore, providing the training to make silk garland making will help to develop skilled manpower in the field.
8. Job Profile	Would be employed in cottage industries, handicraft factories and self employed

9. Course Content:

Practical Competencies	Underpinning Knowledge(Theory)
GENERAL A) Safety Precautions <ul style="list-style-type: none"> ➤ Safety working methods with blades, threads, needles, and scissors. ➤ Use of finger caps. ➤ Handling of dyes. ➤ Practice good housekeeping. ➤ Practice of First Aid B) Professional ethics <ul style="list-style-type: none"> ➤ Obedience and punctuality. ➤ Importance of personnel safety. APPLICATION <ul style="list-style-type: none"> ➤ Safe handling of cutting tools like blades, threads, needles and 	<ul style="list-style-type: none"> ➤ Importance of garland making. ➤ Types of cocoon garlands that can be produced using cut cocoons and waste silk. ➤ Raw materials required. ➤ Dyes and dyeing of cocoons and silk. ➤ Designing and methods of garland making. ➤ Importance of safety of during production of silk garlands. ➤ Use of aprons, gloves, hood and equipments. ➤ First aid for minor cuts; foreign body in eye etc.

<p>scissors.</p> <ul style="list-style-type: none"> ➤ Plant Layout & Working ➤ Material Handling ➤ Preparing cocoon and silk garlands of different designs. ➤ Types of scissors and methods of using them. <p>PROCESSING</p> <ul style="list-style-type: none"> ➤ Identification of the layout. ➤ Maintain and store raw materials like cut cocoons, silk and other raw materials ➤ Procurement of quality raw materials, colours, threads and cleaning, and storing. ➤ Different types of cocoon cutting. ➤ Different types of knotting silk threads. ➤ Colouring cocoons and silk. ➤ Mixing of dyes. ➤ Prepare different types of garlands and decorating methods. ➤ Maintenance of inventory and book keeping. ➤ Packing of products in suitable boxes so as to maintain quality. 	<ul style="list-style-type: none"> ➤ Basics of hygiene, personal hygiene. ➤ Desirable qualities of good human relationship. ➤ Importance of time & communication skills.
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10. Tools and Equipments to train 20 candidates per batch

Sl.No.	Item	
1	Scissors – standard type.	20 no
2	Scissors – zig zag cutting type.	20 no
3	Scissors – bent type.	20 no
4	Steel blades.	5 doz
5	Twine threads	50 rolls
6	Nylon threads	50 rolls
7	Tange wire	2 kg
8	Dye stuff – 100g per colour, basic colours	100 g
9	Plastic crates (2' x 3').	10 no
10	Sealing machine.	02 no
11	Weighing scale (electronic weighing scale) (10 – 1000g capacity).	02 no
12	Plastic bins 2' x 1.5' x 1.5' h.	5 no
13	Working tables	4 no
14	Length Measuring scale	10 no

15	Sewing needles – assorted size	20 sets
16	Steel containers for dyeing the cocoons and silk	10 no
17	Plastic drums for cut cocoon storing	10 no
18	Vacuum cleaner.	1 no
19	Garland decorative materials like colour papers, colour strips, etc.	As needed
20	Fevicol	As needed
21	Satin Ribbon	10 rolls
22	Chamble	As needed
23	Decorative Balls	As needed
24	Decorative Bells	As needed
25	Cellophane Tape	20 rolls - big
26	Packing materials like, polythene covers, paper covers, etc.	As needed
27	Reege	As needed
28	Handicraft Decorative Mix	As needed
29	Clipper	20 no
30	Cutters	20 no

LEVEL – 1

1. Module Name	Mulberry Garden Establisher.
2. Sector	Sericulture.
3. Code	SER. 210
4. Entry Qualification	Minimum 5 th standard + SER 101 and 14 years of age.
5. Technical Competency	After completion of the course, the trained candidate would be able to carry out the establishment of mulberry garden.
6. Duration	150 hours.
7. Preface	Mulberry (<i>Morus</i> spp.) leaf is the chief source of feed for silkworms (<i>Bombyx mori</i> L.). As such mulberry leaf yield and quality are the most important determining factors in getting good cocoon productivity. Mulberry being deep rooted, high biomass producing perennial plant, proper initial establishment of the garden is important from the point of subsequent growth and leaf yield. To obtain good quality leaf yield on sustainable basis, establishment of mulberry garden scientifically is very much essential.
8. Job Profile	Self employment and employable at sericulture farms.

9. Course Content:

Practical Competencies	Under pinning Knowledge (Theory)
<ul style="list-style-type: none"> ➤ Discipline and punctuality ➤ Interaction with departmental officials and subject experts 	<ul style="list-style-type: none"> ➤ Importance of mulberry establishment in sericulture ➤ Impact of environmental factors like rainfall, temperature, light,

<ul style="list-style-type: none"> ➤ Study of typical soil profile and identification of different soil types ➤ Soil testing – collection and preparation of composite soil sample, labeling and sending to soil test lab; study of soil test report and soil amendments ➤ Identification of popular mulberry varieties based on morphological features ➤ Use of farm implements like tractor, power tiller and bullock drawn implements for land preparation like ploughing/ digging, leveling, bunding, furrow making, planting, weeding, etc ➤ Selection of suitable planting materials like saplings, grafts, etc. ➤ Land preparation for planting – layout by actual measurements, ploughing/ digging, leveling, bunding, etc. ➤ Practicing measurement and marking for different spacing and techniques of planting like making pits, trenching, application of FYM, planting of saplings, etc. under rain fed and irrigated conditions ➤ Irrigation practices and maintenance of systems/ appliances ➤ Identification and study of manures/fertilizers, oil cakes and materials used for soil amendments ➤ Time and type of application of fertilizers and calculation of 	<ul style="list-style-type: none"> humidity and wind on mulberry growth and productivity ➤ Prevailing agro-climatic conditions and mulberry cultivation ➤ Mulberry growth and nutrition ➤ Soil texture, structure, topography, soil testing and correction measures with special reference to mulberry cultivation ➤ Morphology of mulberry and propagation methods and advantages of vegetative propagation ➤ Mulberry establishment under rain fed and irrigated conditions ➤ Popular mulberry varieties and selection of suitable region-specific variety ➤ Selection and preparation of land – layout by measurements, understanding different conversions and applying them before digging/ ploughing, leveling, bunding, pit making, trench/furrow formation ➤ Irrigation – importance, sources, different methods and adoption of suitable method, quantity and frequency of irrigation ➤ Mulberry planting – systems of planting and their advantages and disadvantages, spacing, depth and time of planting, application of FYM and planting of saplings/cuttings ➤ Maintenance of mulberry garden
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<p>dosage/mixing</p> <ul style="list-style-type: none"> ➤ Familiarization with intercultural operations during establishment period including initial harvesting ➤ Maintenance of farm records ➤ Intensive training in a model sericulture farm ➤ Safe practices while on work and in handling fertilizers and pesticides 	<p>during first year of establishment - intercultural operations like weeding, irrigation and manuring</p> <ul style="list-style-type: none"> ➤ Time and type of initial leaf harvest ➤ Safety measures in land preparation, intercultural operations, fertilizer/pesticide application and knowledge of safe disposal
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10 Tools and Equipments for a batch of 20 students

Sl. No.	Description	Quantity
For study of morphology of mulberry plant:		
01	Fresh specimens of sapling/seedling, stems, roots, leaves, flowers, fruits and seeds	As required
02	Forceps, needles, beakers or conical flasks	5 No
For collection and preparation of composite soil sample for testing:		
03	Soil auger (10 cm dia.)/soil tube/spade (mumty)/shovel	5 No
04	Iron pan, plastic basin and plastic bucket	5 No each
05	Clean sheet of thick paper	5 No
06	Plastic bag to hold 0.5 kg soil sample	4 to 6 No
07	Cloth bag, 20 x 24 cm size, made of white drill cloth	4 to 6 No
08	Information sheet	20 No
09	Ball point pen or copying pencil	10 No
10	Label	50 No
Garden implements:		
11	Spade (mumty), pickaxe, digging fork, shovel and crowbar	5 No each

12	Pruning sickle, pruning saw, weeding sickle, secateur and bill hoe	5 No each
13	Water can, plastic pots and iron pan/bamboo basket	5 No each
For land preparation and planting:		
14	Land for establishment of mulberry garden	1 plot of 100' x 100'
15	Mould board plough, disc plough, rotary cultivator, leveler and ridger plough	1 No each
16	Bullock drawn iron/wooden country ploughs, blade harrow, rotary harrow and earth scoop	1 No each
17	Lime and gypsum, in case of soil amendment	As required
18	Farmyard manure and composts	As required
19	Saplings	As required
20	Measuring tape and Nylon thread	100 m/ 1 No
21	Fertilizers like urea, ammonium sulphate, calcium ammonium nitrate, single super phosphate, muriate of potash, complex fertilizers of 15 and 17 all and rock phosphate	5 kg each
22	Oil cakes of neem and groundnut	5 kg each
23	Leaf basket	5 No
24	Farm records for plot, work and inventory	5 No each

LEVEL-2

1. Module Name	Mulberry Garden Maintainer.
2. Sector	Sericulture.
3. Code	SER. 211
4. Entry Qualification	Minimum 5 th standard + SER 101 and 14 years of age.
5. Technical Competency	After completion of the course, the trained candidate would be able to carry out the activities of maintenance of mulberry garden scientifically.
6. Duration	200 hours.
7. Preface	The profitability in sericulture depends on quantum of quality leaf produced in a unit of mulberry garden at a given cost. After the establishment of mulberry gardens, sericulturists must obtain economic leaf yield consistently for about 15 years under irrigated and 10 years under rain fed conditions. Based on system of mulberry cultivation and type of rearing adopted, yearly 5-6 leaf harvests will be made by sericulturists from a mulberry garden, under tropical climatic conditions. This will lead to rapid depletion of nutrients in the soil. To obtain good leaf yield for long period, maintenance of mulberry gardens in optimum conditions by following recommended package of practices assiduously assumes special importance.
8. Job Profile	Self employment and employable at sericulture farms.

9. Course Content:

Practical Competencies	Under pinning Knowledge (Theory)
<ul style="list-style-type: none"> ➤ Discipline and punctuality ➤ Interaction with departmental 	<ul style="list-style-type: none"> ➤ Importance of maintenance of mulberry gardens in optimum conditions in the context of

<p>officials and subject experts</p> <ul style="list-style-type: none"> ➤ Practicing different methods and frequency of pruning followed in mulberry cultivation under rain fed and irrigated conditions; care to be taken during and after pruning ➤ Acquainting intercultural operations followed in mulberry cultivation like ploughing digging, hoeing, etc. ➤ Identification of common weeds found in mulberry gardens. Time and methods of weeding – mechanical and chemical method ➤ Practicing different methods of irrigation (furrow, flat bed, basin, drip and sprinkler); when to irrigate, how much to irrigate and how best to irrigate; frequency of irrigation in relation to root system and growth stage of mulberry plants/seasons/types of soils ➤ Practicing different methods of mulching (with soil, organic and artificial mulches) ➤ Practicing methods of drip-fertigation to mulberry gardens ➤ Identification of various types of bulky and concentrated organic manures. Preparation of organic manures, their storage, time, dose and method of application ➤ Recycling of sericulture farm wastes ➤ Use of various types of green manures and biofertilizers; time and method of their application 	<p>silkworm rearing</p> <ul style="list-style-type: none"> ➤ Objectives, principles and different systems of mulberry pruning ➤ Scope of intercultural operations – ploughing/digging, furrowing, etc. ➤ Effect of weeds on mulberry leaf yield and quality. Common weeds of mulberry gardens. Time and different methods of weed control followed in mulberry cultivation ➤ Significance of soil moisture with reference to mulberry gardens ➤ Methods of irrigation, fertigation and mulching in mulberry cultivation ➤ Importance of organic manures in mulberry cultivation and types of organic manures. Time, dose and method of their application ➤ Green manures and biofertilizers in mulberry cultivation. Various types of green manures and biofertilizers and time and method of their application ➤ Role of fertilizers in mulberry cultivation. Types of fertilizers, time, dose and
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<ul style="list-style-type: none"> ➤ Use of various types of chemical fertilizers, their storage, time and method of application ➤ Practicing application of foliar sprays to mulberry plants ➤ On farm training at model sericulture farm ➤ Safe practices while on work and in handling fertilizers pesticides/weedicides 	<p>method of their</p> <ul style="list-style-type: none"> ➤ Foliar sprays and their application to mulberry gardens ➤ Scope of intercropping and mixed cropping with mulberry ➤ Principles and scope of adopting dry farming technology for mulberry gardens ➤ Factors involved in cost of cultivation of mulberry
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10. Tools and Equipments required for training a batch of 20 students.

Sr.No	Description	Quantity
For pruning of mulberry plants:		
01	Mulberry plants	As required
02	Pruning sickle, pruning saw and secateur	5 No each
03	Knapsack sprayer (16 lit. cap.)	1 No
	Fungicides (Dithane M45/Bavistin)	0.5 kg each
04	Field note book and pencil	5 No each
For mechanical weed control:		
05	Mulberry field with weeds	
06	Weeding sickle, weeding fork and digger	5 No each
07	Tray or bamboo basket	5 No each
08	A pair of bullocks with blade harrow/cultivator	1 No each
09	Field note book and pencil	5 No each
For chemical weed control:		

10	Glycel or other weedicides and Ammonium sulphate	1 lit./500 g
11	Measuring cylinder (1000 ml cap.)	1 No
12	Plastic bucket	1 No
13	Knapsack sprayer with WFN 40 or WFN 62 fan type nozzle	1 set
14	Clean water	As required
15	Field note book and pencil	5 No each
	For preparation of farmyard manure:	
16	Pickaxe, spade, measuring tape and basket	5 No each
17	Dung/urine of farm animals, silkworm litter, etc	As required
	For preparation of compost:	
18	Vegetable wastes, farm and rearing wastes, cow dung, wood ash, etc.	As required
19	Super phosphate or Rock phosphate	5 kg
20	Inoculum of lignocellulotic decomposing fungi	5 kg
21	Loamy soil	As required
22	Spade, sickle and baskets	5 No each
	For application of organic manures:	
23	Well decomposed FYM , compost, vermin-compost	As required
24	Iron pan/bamboo basket and spade	5 No each
25	Top load mechanical balance (25 kg cap.)	1 No
	For application of chemical fertilizers:	
26	Fertilizers like urea, ammonium sulphate, calcium ammonium nitrate, single super phosphate, diammonium phosphate, muriate of potash, complex fertilizers of 15 and 17 all and rock phosphate	5 kg each
27	Plastic or metallic tray or iron pan and digger	5 No each

28	Top load mechanical balance (25 kg cap.)	1 No
For application of green manure seeds:		
29	Green manure seeds (Sunnhemp, Dhaincha, Horsegram, Cowpea, etc.)	5 kg
30	Shoots of Pongamia and Glyricidia	As required
31	Garden implements used for land preparation	As required
32	Balance	1 No
For application of biofertilizers:		
33	Nitrogen fixing, phosphate solubilizing and phosphorus mobilizing biofertilizers	5 kg each
34	Well decomposed FYM	25 kg
35	Plastic or metallic trays and spade	5 No each
36	Balance	1 No
37	Field note book and pencil	5 No each
For application of foliar spray:		
38	Foliar spray	1 lit.
39	Clean water	15 lit.
40	Measuring cylinder (500 ml cap.)	1 No.
41	Sprayer and plastic bucket	1 No each
42	Field note book and pencil	5 No each
For application of mulches to mulberry gardens:		
43	Loamy soil/sand	As required
44	Crop residue/stubble	As required
45	Shoots of green manure crops	As required
46	Black polyethylene sheet (1 m x 5 m)	5 No

LEVEL - 2

- 1. Module Name:** Vermicompost Producer
- 2. Sector:** Sericulture
- 3. Code:** SER – 212
- 4. Entry Qualification:** Minimum 5th Standard + SER 101 and 14 years of age
- 5. Terminal Competency:** Successful candidates would be able to produce vermicompost required to improve the fertility status of the mulberry garden.
- 6. Duration:** 200 hours
- 7. Preface:** Mulberry requires high amount of nutrients for its growth and development. It is needless to stress the importance of organic manure like vermicompost in improving the soil fertility and mulberry crop production. There is a scarcity of quality vermicompost in the rural areas due to lack of knowledge on its production. Therefore, well trained personnel in vermicompost production will contribute for quality mulberry leaf production.
- 8. Job Profile:** Employable in sericulture farms and also can be self employed.
- 9. Course Content:**

Practical competencies	Under pinning knowledge (Theory)
➤ Construction of vermicompost pits with shed as per recommendation.	➤ Requirement of manure and fertilizers for mulberry cultivation.
➤ Procurement of raw materials like farm waste, dry leaves, vegetable waste, hay, cow dung, biogas slurry, sericultural wastes etc.	➤ Importance of vermicompost in mulberry cultivation.
➤ Semi-decomposting of raw materials. Maintenance of suitable temperature and moisture.	➤ Infrastructure required for vermicomposting – suitable site, earthworm rearing pits, shed, semi – decomposting pit, water tank, etc.
➤ Procurement of suitable earthworm strains from research organizations/private firms.	➤ Types of earthworms and their characteristic features.

➤ Preparation of earthworm beds in the rearing pit using paddy husk, saw dust, coir waste, groundnut shells, etc.	➤ Earthworm life cycle.
➤ Shifting of semi – decomposed raw materials to earthworm rearing pits. Use of inoculums of decomposers	➤ Types of raw materials used for vermicomposting.
➤ Release of earthworm strains to the semi – decomposed wastes – quantity, method of release.	➤ Vermicompost production; Semi– decomposing of raw materials, maintenance of suitable temperature and moisture, hygiene, sieving of vermicompost, separation of vermicompost, need for conditioning of vermicompost and packing.
➤ Maintenance of required amount of moisture in the vermicompost bed.	➤ Precaution and care to be taken during vermicomposting.
➤ Protection of earthworms from high temperature, bright light, rodents, lizards, toads, snakes, etc.	➤ Protection of earthworms from pests and predators.
➤ Periodic observations on conversion of raw materials into vermicompost.	
➤ Sieving of vermicompost to separate earthworms as well as pupae.	
➤ Inoculation of earthworms and pupae to the fresh bed.	
➤ Conditioning of vermicompost, packing and disposal.	
➤ Practicing safety aspects and personal hygiene	

10. Tools and equipments required for a batch of 20 students.

	Earthworm pit (2.4 L x 0.6 W x 0.45 D mt)	4
2.	Shed (7.6 x 6 mt)	1
3.	Organic waste; cattle dung, biogas slurry,	As required
4.	Water tank	1

5.	Earthworm culture, decomposing microorganisms (inoculums)	As required
6.	Sieve, soil thermometer	2 each
7.	Gunny bags	6
8.	Spade, digger, plastic basket, weeding fork, plastic pot, hose pipe,	2 each
9.	Gum shoes, hood, post-mortem hand gloves,	

LEVEL - 2

- 1. Module Name:** Sanitation and Disinfection Assistant.
- 2. Sector:** Sericulture
- 3. Code:** SER 213
- 4. Entry Qualification** Minimum 5th Standard and 14 years of age
- 5. Terminal Competency:** The successful candidate would be able to take up disinfection in grainage, CRC and rearing house.
- 6. Duration:** 200 hours
- 7. Preface:** Silkworms are prone to attack by various diseases and disinfection is the eradication of disease causing organisms. Disinfection is an important activity in harvesting successful cocoon crop. This activity involves use of disinfectants/chemicals with precise dilution and proper spray. Therefore, the skill development in disinfection and sanitation is of most important in sericulture activities. Thus, the present module is proposed.
- 8. Job Profile:** The person would be able to work as disinfectant in the CRC, grainage and rearing house. Self employment.

9. Course Content

Practical Competencies	Under Pinning Knowledge (Theory)
➤ Discipline and punctuality.	➤ Brief knowledge of silkworm diseases.
➤ Practice of safety aspects and disinfection. Cleaning of rearing room, grainage appliances and surroundings.	➤ Principles of disinfection.
➤ Working appliances of grainage and rearing house with bleaching powder solution and plain water.	➤ To understand the importance of sunlight, hot water and flame on pathogen.
➤ Sun drying the appliances in the clean area and making the rearing house, grainage, CRCs dry.	➤ Cleaning of grainage, rearing house and appliances and sun drying. Methods of disinfection.
➤ Wearing apron, masks, gloves and operation of disinfection machine and maintenance of appliances.	➤ Safety in disinfection.
➤ Preparation of quality of lime solution to be used and white washing.	➤ Knowledge of different gadgets used during disinfection and their maintenance.
➤ To know various recommended chemical disinfectants available for use	➤ Quality of lime powder and preparation of lime powder solution.

in grainage, CRCs and rearing house.	
➤ Materials required for disinfection and preparation of working solutions for disinfection.	➤ Different kinds of appliances used during disinfection and conditions to be maintained.
➤ Disinfection of grainage, rearing house and appliances by spraying.	➤ Safe disposal of waste materials and residue of disinfected bed.
➤ Calculating the dilution of stock/commercial disinfection and purpose of working solution.	➤ Knowledge about the concentration of commercial formulations and its dilutions to working solutions.
➤ Calculating the working solution required for spray to a given area.	➤ Measurement of quality required to a given area.
➤ Maintenance of temperature and relative humidity during disinfection	➤ Role of lime and detergents.
➤ Practicing eco-friendly method of waste disposal and precaution for using disinfectants.	

10. Tools, equipments and chemicals required for a batch of 20 students.

13.	Wash Basin	2 Nos.
14.	Sprayer, Gloves and Mask	1 Set
15.	Room Heater	1 No.
16.	Measuring Jar	2 Nos.
17.	Bucket	3 Nos.
18.	Weighing Scale	1 No.
19.	Measuring Tape	1 No.
20.	Room Disinfectant	5 Kgs.
21.	Bleaching Powder	5 Kgs.
22.	Lime Powder	5 Kgs.
23.	Detergent	1 Kgs.
24.	Personnel Hygiene	1 Bottle

25.	News Paper	5 Kgs.
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LEVEL –2

1. Module name	Late age silkworm rearing assistant
2. Sector	Sericulture
3. Code	SER 214
4. Entry Qualification	Minimum 5th standard + SER 103 and 14 years of age
5. Terminal competency	After completion of this level the trained person will have the basic skill of late age silkworm rearing
6. Duration	200 Hours
7. Preface	Late age silkworm rearing comprises of III, IV and V instars with a total larval duration of 18 to 20 days. During this period, the silkworm consumes more than 90% of the total feed requirement and more than 130 times in body size and weight. Late age larvae are sensitive to high temperature and humidity. Growth and survival of the larvae directly influences the cocoon yield and quality. Therefore, development of silkworm rearing skills is an essential requirement for persons handling late age silkworms
8. Job Profile	The rearing assistant can be employed in the Commercial rearing units and also can be Self Employed

9. Course Content:

Practical Competencies	Underpinning Knowledge(Theory)
GENERAL A) Safety Precautions <ul style="list-style-type: none"> ➤ Safety working methods with rearing equipments particularly leaf/shoot chopping tools. ➤ Wearing of protective clothing and gadgets while working. ➤ Practice good housekeeping. ➤ First Aid Practices eg. Treating cut wounds and electric shock by conducting Mock drill. B) Professional ethics <ul style="list-style-type: none"> ➤ Ethics at working place. 	<ul style="list-style-type: none"> ➤ Rearing fundamentals and equipments required. ➤ Ideal environmental conditions for rearing. ➤ Importance of safety during late age rearing. ➤ Protective clothing and equipments during dusting of disinfectants and during rearing. ➤ First aid for minor cuts; foreign body in eye etc. ➤ Basic of personal & rearing hygiene.

<ul style="list-style-type: none"> ➤ Obedience and punctuality. <p>APPLICATION</p> <ul style="list-style-type: none"> ➤ Handling of knives and sickles. ➤ Layout of late age rearing house and placement of equipments. ➤ Ventilations required. ➤ Providing shade around the rearing hall. ➤ Leaf/shoot preservation room maintenance. <p>PROCESSING</p> <ul style="list-style-type: none"> ➤ Disinfection of rearing appliances and late age rearing room and surroundings. ➤ Transfer of larvae from rearing trays to shoot rearing rack/late age rearing tray. ➤ Identifying age of the larvae and developmental stages of the larvae. ➤ Selection of leaf quality as per the age of the larvae. ➤ Maintenance of temperature and humidity and methods of maintaining them; Wet & Dry bulb thermometer maintenance and reading. ➤ Feeding time, quantity of mulberry leaves, bed area and methods of spreading the bed and larval density. ➤ . ➤ Aeration & Methods of providing ventilation in the rearing room. ➤ Preparation of lime powder from lime stone, powdering, dusting and storing. ➤ Calculating and measuring the required quantity of lime powder to the bed. ➤ Practicing different methods of application of lime powder to the rearing bed. ➤ Use of different types of bed disinfectants for different seasons/ diseases. ➤ Identification of healthy, un-equal and sick silkworms. ➤ Identification of diseased silkworm 	<ul style="list-style-type: none"> ➤ Desirable qualities of good human relationship. ➤ Importance of time & communication skills. ➤ Types of silkworms – multivoltines, bivoltines and cross bred races. ➤ Manipulation of temperature and humidity inside the rearing room. ➤ Basics about aeration and light inside the rearing room. ➤ Quality of mulberry leaf for late age larvae, time of harvesting and leaf preservation methods. ➤ Silkworm diseases – pebrine grasserie, flacherie and muscardine. ➤ Identification of diseased larvae and control methods. ➤ Use of bed disinfectants. ➤ Method of disposing the diseased larvae – burying or burning. ➤ Importance of Uzi flies management. ➤ Use of lime powder to the rearing bed and surroundings of rearing house. ➤ Spinning larvae, mountages and mounting care. ➤ Cocoon harvesting and importance of cleaning the cocoons before marketing and safe transportation. ➤ Cleaning and disinfection of rearing appliances and rearing room after rearing completion.
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<ul style="list-style-type: none"> larvae and their safe disposal. ➤ Bed cleaning practices and safe disposal of bed refusals. ➤ Identification of Uzi infestation and prevention. ➤ Dusting of Uzi powder to the rearing bed and larvae (quantity & time). ➤ Cleaning of mountages using flame. ➤ Identification of spinning worms, mounting spinning larvae to the mountages. ➤ Use of different types of mountages. ➤ Providing good aeration, temperature, humidity and light during spinning. ➤ Protection of spinning larvae from predators like ants and rodents. ➤ Harvesting the cocoons, cleaning, packing and safe transport for marketing. ➤ Cleaning and disinfection of rearing room and appliances after completion of rearing. 	
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10. Tools and Equipments to train 20 candidates per batch

Sl. No.	Item
	Non-Recurring
1	Disinfection Mask – 2 sets
2	Gumboots – 2 sets
3	Chawki rearing room/leaf preservation room
4	Late age rearing hall with ante room, leaf preservation room
5	Egg transportation box – 3 no.
6	Egg incubation box/pot – 1 no.
7	Black box – 6 no.
8	Rearing plastic trays – 50 no.
9	Bottom stand – 10 no.
10	Shoot rearing rack – 2 no.
11	Feeding stand – 3 no.
12	Ant wells – 60 no.
13	Leaf chopping board – 2 no.
14	Leaf chopping knife – 2 no.
15	Leaf mats (4' X 6') rexin – 2 no.
16	Bed cleaning nets (adult size) – 50 no.
17	Late age rearing bamboo tray - 50 no.
18	Rearing stand – 2 no.

19	Mountages – 50 no.
20	Multi purpose Pump (Sprayer) – 1 no.
21	Room heater with thermostat, blowing type – 3 no.
22	Air cooler – 1 no.
23	Wet and dry bulb thermometers – 6 no.
24	Kerosene blow lamp or LPG blow lamp – 1 set
25	Forceps 6” long – 5 no.
26	Plastic buckets – 3 no.
27	Plastic boxes of different colours – 6 no.
28	Plastic sieve – 2 no.
29	Plastic basin – 5 no.
30	Plastic mug – 3no.
31	Cora cloth – 10 mts
32	Gunny cloth – 25 mts.
33	Deflossing machine – 1 no.
34	Cocoon collection plastic bins – 5 no.
	Recurring items (for 2 crops/batch)
1	Room disinfectants – 5 lts
2	Bleaching powder – 5 kg
3	Lime powder – 10 kg
4	Bed disinfectants – 10 kg
5	Uzi powder – 10 kg
6	Old news paper – 2 kg

LEVEL - 2

1. Module name	Silkworm Protector
2. Sector	Sericulture
3. Code	SER - 215
4. Entry Qualification	Minimum 5th standard + SER 105 and 14 years of age
5. Terminal competency	Successful candidate would be able to identify the disease and pests of silkworms and take necessary steps to prevent coco crop loss.
6. Duration	200 hours
7. Preface	Diseases of silkworms cannot be cured. Therefore, identification of diseases of silkworms at an early is an important activity in sericulture to prevent crop loss.
8. Job Profile	Silkworm protector can be employed in CRCs, Rearing establishments, Grainages and Self employment (Seri Clinic)

9. Course Content:

Practical Competencies	Underpinning Knowledge(Theory)
GENERAL A) Safety Precautions <ul style="list-style-type: none"> ➤ Safety working methods in handling disinfectants, pesticides and chemicals. ➤ Use of protective gears like; disinfection suit, aprons, headgear, mask, gloves and Gumboots and disinfection suit. ➤ Practice good housekeeping. ➤ Practice of First Aid B) Professional ethics <ul style="list-style-type: none"> ➤ Ethics at working place. ➤ Obedience and punctuality. APPLICATION <ul style="list-style-type: none"> ➤ Practice of disinfection, use of disinfectants and chemicals. Measures/proportions and mixing of chemicals. ➤ Storing the disinfectants and pesticides (safety and easy identification – by colour coding). ➤ Identification of disease symptoms, infected silkworms, eggs, moth and selection of suitable disinfectants to 	<ul style="list-style-type: none"> ➤ Impact of silkworm diseases on cocoon production. ➤ Importance of safety and handling of pesticides. ➤ Protective clothing and equipments during disinfection. ➤ First aid for minor cuts; foreign body in eye etc. ➤ Basic of hygiene, personal hygiene. ➤ Desirable qualities of good human relationship. ➤ Importance of time & communication skills. ➤ Rearing fundamentals, environmental conditions for rearing in relation to silkworm diseases. ➤ Temperature and humidity required during rearing and methods of maintaining them; Wet & Dry bulb thermometer maintenance and reading. ➤ Aeration and light inside the

<p>control specific disease.</p> <p>PROCESSING</p> <ul style="list-style-type: none"> ➤ Practical use of magnifying lens, microscope, sprayers, dusters and other gadgets in identifying and controlling the diseases. ➤ Control of rodents, ants, lizards and predators. ➤ Disinfection of rearing appliances, rearing room and surroundings. ➤ Providing ventilation in the rearing room. ➤ Preparation of lime powder from lime stone, dusting and storing. ➤ Identification of healthy, un-equals and sick silkworm larvae. ➤ Identification of silkworm diseases and methods of handling diseased larvae and their safe disposal. ➤ Use of different types of bed disinfectants for different seasons/ diseases. ➤ Quantity of bed disinfectants required for 100 dfls. ➤ Preventing Uzi infestation, Integrated Pest Control including biocontrol methods ➤ Dusting of Uzi powder to the rearing bed and larvae (quantity & time). ➤ Protection of spinning worms from predators. ➤ Disposing the bed wastage. ➤ Preparation of compost pit and management of compost. ➤ Cleaning the rearing room and appliances after completion of rearing 	<p>rearing room.</p> <ul style="list-style-type: none"> ➤ Silkworm diseases – pebrine, grasserie, flacherie and muscardine. ➤ Identification of diseased larvae. ➤ Method of handling and disposal of diseased larvae – burying or burning. ➤ Important pests of silkworm viz., Uzi fly, ants, rodents and lizards. ➤ Importance of Uzi flies management on cocoon yield and economics. ➤ Use of lime powder in silkworm rearing. ➤ Importance of cleaning the rearing appliances and rearing room after completion of rearing. ➤ Compost pit management.
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10. Tools and Equipments to train 20 candidates per batch

Sl. No.	Item	
	Non-Recurring	
1	Disinfection Mask	20 sets
2	Gumboots	20 sets
3	Hand gloves	30 pairs
4	Disinfection suit	5 sets
5	Multi purpose Pump (Sprayer)	1 no.
6	Rocking sprayer	1 no.
7	Mechanical Dusters	5 no.
8	Illuminated Magnifying Glass	5
9	Wet and dry bulb thermometers	6 no.

10	Kerosene blow lamp or LPG blow lamp set	1
11	Forceps 6" long	5 no.
12	Plastic buckets.	3 no
13	Plastic boxes of different colours	6 no.
14	Plastic sieve	2 no.
15	Plastic basin	5 no.
16	Plastic mug	3no.
17	Cora cloth	10 mts
18	Gunny cloth	25 mts.
Recurring items (for 2 crops/batch)		
1	Room disinfectants	5 lts
2	Bleaching powder	5 kg
3	Lime powder	10 kg
4	Bed disinfectants	10 kg
5	Uzi powder	10 kg
6	Old news paper	2 kg

LEVEL – 2

- 1. Module Name:** Acid treatment technician.
- 2. Sector:** Sericulture Egg Production.
- 3. Code:** SER - 216
- 4. Entry Qualification** Minimum of 10th standard and 17 years of age.
- 5. Terminal Competency:** After completion of the course, the trained person would be able to operate Acid Treatment Bath and treatment of bivoltine silkworm eggs to produce good quality laying.
- 6. Duration:** 150 hours
- 7. Preface:** Bivoltine silkworm eggs need to be acid treated to prevent diapause. This involved usage of Hydrochloric acid (HCl) and knowledge to treat the eggs at a particular temperature and duration. Therefore, skill is need for the technician to do the acid treatment safely without damaging the eggs and person
- 8. Job Profile:** Employable in grainage as an acid treatment technician.
- 9. Course Content**

Practical Competencies	Under Pinning Knowledge (Theory)
➤ Identification of diapause and non-diapause eggs.	➤ Basic knowledge of Diapause and non-diapause in silkworm eggs.
➤ Demonstration of different equipments used for acid treatment of silkworm eggs and their maintenance.	➤ Morphology and handling of eggs.
➤ Use of hydrochloric acid, fixing specific gravity in relation to temperature and dilution.	➤ Importance of 2% formalin solution treatment to egg sheets.
➤ Use of hydrometer, thermometer and audio-visual timer.	➤ Knowledge about acid treatment bath, hydrometer, thermometer, timer, etc.
➤ Preparation of acid treatment bath	➤ Acid treatment of eggs (Loose and sheet). Hot acid and cold acid treatment. Acid treatment after short term and long term cold storage.
➤ Pre-treatment of eggs sheets with 2% formalin to fix eggs to sheet.	➤ Brief properties of Hydrochloric acid. Dilution of hydrochloric acid to know specific gravity and relation of temperature on specific gravity. Effects of HCl on human beings.
➤ Hot and cold acid treatment of loose	➤ Knowledge about safety aspects of

and sheet eggs.	acid treatment.
➤ Sheet egg acid treatment after short term and long term chilling	➤ Washing and drying of eggs (Loose and sheet).
➤ Washing and drying of eggs after acid treatment. Use of litmus paper to check the acids on the egg sheet.	➤ Packing of eggs for disposal and cold storage.
➤ Winnowing and drying of loose eggs.	
➤ Packing of loose and sheet eggs for incubation, cold storage and for sales.	
➤ Punctuality and discipline.	
➤ Safety practices in the laboratory.	

10. Tools, equipments and chemicals required for a batch of 20 students.

1.	Acid Treatment Bath	2 No.
2.	Hydrometer	3 No.
3.	Thermometer	3 No.
4.	Refrigerator 300 lt.	1 No.
5.	Egg Sheet	20 No.
6.	Mask and Gloves	1 Set.
7.	Hydrochloric Acid	2 Lt.
8.	Glass Rod	20 No.
9.	Pipette	5 No.
10.	Plastic beaker (1000 ml)	5 No.
11.	Plastic beaker (5000 ml)	5 No.
12.	Plastic measuring cylinder (500 ml)	5 No.
13.	Plastic Wash Basin (20 lt.)	3 No.
14.	Loose Egg Box	25 No.
15.	Plastic cans to store HCl (15 lt.)	3 no.

16.	Ammonia solution (antidote)	500 ml
17.	Litmus paper	2 books

LEVEL – 2

- 1. Module Name:** **Silkworm Cold Storage Operator**
- 2. Sector:** Sericulture
- 3. Code:** **SER - 217**
- 4. Entry Qualification** Minimum of 10th standard and 17 years of age.
- 5. Terminal Competency:** After successful completion of the training the candidate would be able to maintain cold storage and preservation of silkworm eggs, cocoons and moths in cold storage.
- 6. Duration:** 150 hours
- 7. Preface:** In sericulture, the demand of eggs for rearing will not be uniform through out the year. When the seed cocoons are available in plenty in favorable seasons, surplus quantity of eggs will have to be prepared and stored in cold storage to be released at the time of demand. Cold storing of cocoons, moths and eggs, is a skilled activity as temperature and humidity in the cold room determine the hatching of eggs. Therefore, technical competency is essential hence this module.
- 8. Job Profile:** Employable in grainage and cold storage attached to grainage. Self employable.

9. Course Content

Practical Competencies	Under Pinning Knowledge (Theory)
• Identification of diapause and nondiapause eggs.	• Principles of cold storage of eggs, cocoons and moths.
• Identification of cocoons of different races, male and female moths.	• Conditions required for storage and safety.
• Method of packing the sheet and loose eggs during cold storage, labeling and preservation.	• Outlines of cold storage, maintenance of temperature, relative humidity, light and machineries
• Practical knowledge of storing nondiapause/ polyvoltine, acid treated eggs, short-term and long-term chilling, aestivation, hibernation schedules and intermediary care.	• Preparation of eggs, cocoons and moths for cold storing.
• Practical knowledge of cold storage of cocoons and moths.	• Knowledge of nondiapausing, acid treated, aestivation and diapausing eggs
• Practical knowledge of cold storage and its functioning. Maintenance of temperature, relative humidity and light (intensity and duration).	• Principles of preservation of sheet and loose eggs for different durations (hibernation schedules) and after acid treatment
• To know the method and storage of egg	• Principles of preservation of

cards and loose eggs.	nondiapausing eggs for different durations
• Inventory of eggs, cocoons and moths	• . Principles of preservation of cocoons and silk moths
• . Safety measures and first aid	• Cold storage of eggs for longer duration – ill effects.
•	• Inventory of materials and maintenance of accounts

10. Tools, equipments and chemicals required for a batch of 20 students.

1.	Cold storage facility	1 No.
2.	Wet and dry thermometer	6 No.
3.	Hygrometer	6 No
4.	Magnifying lens	6 No.
5.	Thermo hygrometer	2 No
6.	Cocoon, moth preservation tray	20 No each.
7.	Sheet egg rack	4 No
8.	Loose egg preservation stand	4 No
9.	Thermal suit	2 set

LEVEL – 2

1. Module Name:	Silkworm Egg Marketing Assistant.
2. Sector:	Sericulture
3. Code:	SER - 218
4. Entry Qualification With Age:	Minimum of 10 th standard and 17 years of age., with basic computer knowledge
5. Terminal Competency:	After completion of the course, the trained person would be able to undertake sale of eggs and maintain financial and material accounts
6. Duration:	150 hours
7. Preface:	Sales of silkworm eggs and maintenance of accounts in the grainage is essential aspect for the profitability of the grainage. Along with accounts, maintenance of inventories like seed cocoons, production of layings has to be taken care off. Therefore, training the candidate for these aspects is essential. Hence this module.
8. Job Profile:	Employable in grainages.

9. Course Content

Practical Competencies	Under Pinning Knowledge (Theory)
➤ Practical knowledge of egg handling like preservation, temperature, relative humidity and hygiene maintenance, black boxing and packing.	➤ Understanding the customer requirement relating to silkworm eggs (area wise, customer wise and season wise). Stock maintenance and sale of eggs.
➤ Identification of cross breed and bivoltine eggs, eye spot and blue eggs.	➤ Principles of egg handling. Preservation of eggs in sale counter. Maintenance of temperature, relative humidity and hygiene.
➤ Packing of loose and sheet eggs for transportation.	➤ Inventory of indents for eggs from rearers.
➤ Writing of cash book, indent book and stock book to record the data.	➤ . Knowledge of identification of cross breed and bivoltine eggs, eye spot and blue eggs.
➤ Data entry and generation of required information. Operation of e-mail and internet browsing.	➤ Package of egg transportation and black boxing.
➤ Market survey, collection of indents and sales of layings.	➤ Safety measures to handle silkworm eggs.
➤ Mock drill of communication skills,	➤ Knowledge of bank transactions

human relationships and marketing techniques.	
➤ Practical knowledge of egg handling like preservation, temperature, relative humidity and hygiene maintenance, black boxing and packing.	➤ Understanding the customer requirement relating to silkworm eggs (area wise, customer wise and season wise). Stock maintenance and sale of eggs.

10. Tools, equipments and chemicals required for a batch of 20 students.

1.	Computer with internet connection and printer	1 set
2.	Calculator	1 No
3.	Land line telephone and mobile	1 No each
4.	Office furniture – 1 table, 4 chairs	2 sets
5.	Showcase and egg cabinet	1 No each
6.	Almirah [Cupboard]	2 No
7.	Refrigerator (300 lit cap)	1 No
8.	Ledgers and files	As needed
9.	Office stationery	As required

LEVEL - 2

- 1. Module Name:** Bamboo Appliances Maker for Silkworm Rearing
- 2. Sector:** Sericulture
- 3. Code:** SER - 219
- 4. Entry Qualification** Minimum 5th Standard and 14 years of age
- 5. Terminal Competency:** Successful candidates would be able to prepare/manufacture the bamboo appliances required for silkworm rearing
- 6. Duration:** 200 hours
- 7. Preface:** In silkworm rearing various appliances like bamboo mountages, trays, leaf baskets, litter baskets are being used. These appliances are prepared by local artisans using bamboo shoots. However, these trained artisans are very few in numbers and confined to some areas/pockets only. On account of this, the sericulturists often face the problem in procurement of appliances. Well trained artisans, therefore, are very much required for the production of uniform quality appliances suitable to the sericulture industry.
- 8. Job Profile** Employable in sericulture/cottage industries and self employable.

9. Course Content:

➤ Selection and procurement of bamboo.	➤ Rearing appliances – Their design, structure and utility.
➤ Cutting and slicing of bamboo for the production of various appliances as per the specification.	➤ Introduction to the usage of bamboo appliances in silkworm rearing.
➤ Training on the different methods of weaving of bamboo mountages, trays, leaf baskets, cocoon storage bins, chop sticks, litter basket, etc., as per the specification.	➤ Importance of bamboo and other locally available materials and their utility
➤ Practicing the artistic skills of making various appliances.	➤ Knowledge about the tools required for cutting, sizing, polishing, etc.
➤ Manufacturing of baskets and trays using toddy palm leaves.	➤ Selection and seasoning of bamboo and other materials and their importance.
➤ Production of leaf baskets using mulberry and lantana twigs and also by using other locally available materials.	➤ Method of slicing and trimming of strips to the required measurement.
➤ Make the appliances as per the drawing	➤ Protection measures to safeguard

provided.	the rearing appliances (Varnishing).
➤ Safety working procedures and necessary precautions while working with tools.	

10. Tools and equipments needed for training 20 trainees.

Carpentry Kit with following items

1	Hammer	10 Sets
2	Sewing needle (Big size)	
3	Cutting Blade/machete	
4	Hand Saw	
5	Knife	
6	Sharpening File/stone	
7	Measuring Scale and tape	
8	Clamps	
9	Carpenter Pincers	
10	Saw Blade	
11	Pliers and Spanner	
12	Nail Puller	
13	Screw Driver	
14	Binding wire, coir rope	
15	Marking Pencils	
16	Setsquare	
17	Painting brush	
18	Paints, varnish, primers, sand paper and polish	
19	Wood marker	

Practical competencies	Under pinning knowledge (Theory)
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LEVEL - 2

- 1. Module Name:** Wooden Appliances Maker for Sericulture
- 2. Sector:** Sericulture
- 3. Code:** SER - 220
- 4. Entry Qualification:** Minimum 5th Standard and 14 years of age
- 5. Terminal Competency:** Successful candidates would be able to prepare/manufacture the wooden appliances required for sericulture activities.
- 6. Duration:** 200 hours
- 7. Preface:** Sericulture activities require various wooden appliances like stand, trays, feeding stand, shoot rearing racks, leaf preservation chamber, leaf chopping board, etc. These articles are being prepared by local artisans using available raw materials like jungle wood, nail, bale hoops, 'L' angles, etc. Due to the paucity of the rural artisans the sericulturists often are facing problem in the production of these appliances. Hence, well trained craftsmen are very much essential for the production of uniform quality wooden appliances as per the specification to help the sericulturists.
- 8. Job Profile:** Employable in sericulture/cottage industry and can be self employed.

9. Course Content:

➤ Selection (avoid wood emitting pungent smell) and procurement of wood and other raw materials.	➤ Introduction to the usage of wooden sericulture appliances at different stages of silkworm rearing.
➤ Sizing of wood for the production of various appliances as per the specification.	➤ Sericulture appliances – Their design, structure and utility.
➤ Demonstration and making of rearing stand, shoot rearing racks, leaf preservation chamber, leaf chopping board, feeding stand etc. as per the specification and the drawing provided.	➤ Introduction on the use of various raw materials (wood, nail, bale hoops, 'L' angles etc.) required for the production of sericulture appliances.
➤ Safety working procedures and necessary precautions while working with tools.	➤ Importance of locally available jungle wood and their procurement.
➤ Protection of sericulture appliances by painting, varnishing and polishing.	➤ Selection and seasoning of wood and their importance.
➤ Make the appliances as per the drawing provided.	➤ Method of preparing the wooden strips, wooden pole and bars.

➤ Safety working procedures and necessary precautions while working with tools.	➤ Method of sizing and trimming the wooden items to the required measurement.
➤ Practicing first aid and personal hygiene	➤ Knowledge about the tools required for cutting, sizing, polishing, etc.
	➤ Protection of sericulture appliances by painting, varnishing and polishing.

10. Tools and equipments required for a batch of 20 students.

Carpentry Kit with following items (Required quantity)		
1	Hammer	10
2	Chisel of different sizes	10
3	Cutting Blade	10
4	Hand Saw	10
5	Knife	10
6	Polishing Diamond File	10
7	Measuring Scale and metal tape	10
8	Jack Planer	10
9	Clamps	10
10	Carpenter Pincers	10
11	Saw Blade	10
12	Wrench	10
13	Pliers and Spanner set	10
14	Nail Puller	10
15	Screw Driver	10
16	Hand drill	10
17	Hacksaw Blade	10
18	Painting brush	10

19	Paints, varnish, primers, sand paper and polish	10
20	Marker pencils	10
21	Table wise	10
22	Working table	10
23	Setsquare	10
24	First aid kit (one set)	10
25	Metal paste	10
26	Waste cloth	10
27	Wood marker	10
28	Nails, bolts and nuts, washers	10
29	Wooden pegs	10

LEVEL 3

- 1. Module Name:** Mulberry Crop Protector
- 2. Sector:** Sericulture
- 3. Code:** SER - 321
- 4. Entry Qualification** Minimum 5th Standard + SER 102 + SER 213 and 17 years of age.
- 5. Terminal Competency:** After completion of the course, the successful candidate would be able to control pests and diseases of mulberry.
- 6. Duration:** 200 hours
- 7. Preface:** Mulberry is prone to be infected by number of pests and diseases through out the year. The main diseases are Leaf spot, Leaf rust, Powdery mildew, Bacterial blight, Root rot and Root knot. Pests like Mealy bugs, Leaf roller, Bihar hairy caterpillar, Jassids and Thrips also affect mulberry. In addition to 20 - 30% leaf yield loss, the leaf quality is also adversely affected which in turn affects the silkworm growth and development, quality of silk and productivity leading to economic loss. Therefore, plant protection is an important component in mulberry cultivation.
- 8. Job Profile:** Employable in sericulture farms and can also take up consultancy in mulberry crop protection (Seri clinic).

9. Course Content:

Practical competencies	Under pinning knowledge (Theory)
<ul style="list-style-type: none"> • Identification of diseases and pests affecting mulberry. 	<ul style="list-style-type: none"> • Impact of diseases and pests on mulberry.
<ul style="list-style-type: none"> • Observing the symptoms of diseases and pests. 	<ul style="list-style-type: none"> • General account on diseases and pests and their symptoms.
<ul style="list-style-type: none"> • Calculating the percentage incidence of diseases/ pests to take up plant protection measures. 	<ul style="list-style-type: none"> • Life cycle of important diseases and pests.
<ul style="list-style-type: none"> • Practicing the control of diseases and pests by field sanitation, soil solarisation, manuring, flooding, mulching, intercropping, weeding and application of oil cakes. 	<ul style="list-style-type: none"> • Mode of diseases and pests transmission.
<ul style="list-style-type: none"> • Practicing the control of diseases and pests by using fungicides/ pesticides – Types of fungicides and pesticides, calculation of concentration and dosage, preparation of working solutions, method of spraying, precaution during spraying, handling of sprayers and maintenance, residual toxicity of pesticides, safe period, use of antidote and safe 	<ul style="list-style-type: none"> • Influence of environmental factors on diseases and pests out break.

disposal of chemical containers.	
• Procurement, multiplication and use of bio-control agents and their maintenance.	• Management of diseases and pests by cultural, chemical and biological methods.
• Identification of alternate hosts of diseases and pests.	• Concepts of Integrated Disease Management (IDM) / Integrated Pest Management (IPM).
• Safety handling of bio-control agents.	• Knowledge on the equipments required for crop protection and safety precautions for self and equipments.
	• Basics of First aid.

10. Tools, equipments and chemicals required for a batch of 20 trainees.

1.	Garden implements - Weeding sickle, pickaxe, spade, knife,	5 no. each
2.	Fungicide – Diathane M ₄₅	100 g
3.	Fungicide – Bavastin	100 g
4.	Insecticide – Nuvan	100 ml
5.	Insecticide – Rogar	100 ml
6.	Bactericides – Streptocycline	100 g
7.	Bucket – 15 lt. with lid	3 no.
8.	Bucket – 20 lt. with lid	3 no.
9.	Mug - 1 lt capacity	6 no.
10.	Knapsack Sprayer (16 lt capacity)	1 no.
11.	Masks and aprons for fungicides / pesticides usage	20 no.
12.	Hand gloves	20 pairs
13.	Hand lens	5 no.
14.	Polythene covers (12'' x 18'')	1 Kg
15.	Gumboots	20 pairs
16.	Measuring cylinder (100 ml – 250 ml - Plastic)	2 each

17.	Electronic balance (100 g to 3 kg capacity)	1 no.
18.	Calculator	5 no.
19.	Napkins – paper and cloth	1 box
20.	Soap solution for hand wash	100 ml
21.	Pencils and note books	20 each

Practical Competencies	Under Pinning Knowledge (Theory)
LEVEL – 3	
1. Module Name:	Seed Cocoon Procurer.
2. Sector:	Sericulture.
3. Code:	SER - 322
4. Entry Qualification	Minimum 10 th standard and 17 years of age or Minimum 5 th Standard and 14 years of age and completion of SER 105 module
5. Terminal Competency:	Successful candidate would be able to select, procure and safe transport of quality seed cocoons required for egg production.
6. Duration:	150 hours
7. Preface:	The hybrid eggs of silkworm are prepared using more than two races. The quality of seed cocoons determines the quality of eggs which in turn influences the cocoon yield. The selection, procurement and transport of seed cocoon need scientific skill. Hence the proposed module.
8. Job Profile:	Employable in grainages or self employment.
9. Course Content	
➤ Learn to identify seed cocoons of different races based on their characters.	➤ Introduction to silkworm egg production and Importance of seed cocoons and their norms.
➤ Learn to identify the quality of seed cocoons based on quantitative parameters and rearing performances.	➤ Knowledge of parental races and their identification.
➤ Identification of pupation stage, melted cocoons and calculation of pupal mortality/ melting /pupation percentage.	➤ Basic knowledge of Pebrine and Muscardine diseases.
➤ Practical knowledge about electronic cocoon weighing machine and calculation of number of cocoons per kilogram.	➤ Analysis of seed crop performance and selection of seed cocoons. Details of the crop history and information of seed grower.
➤ Pupal examination for pebrine and muscardine diseases.	➤ Knowledge about flimsy, melted and other kinds of defective cocoons. Cocoon weight, shell percentage and their calculations.
➤ Learn to count the number of live cocoons/kg in seed cocoons.	➤ Methods of pupal examination for pebrine and calculation of pupation rate
➤ Interaction with market officers and	➤ Brief knowledge about seed act and

seed growers.	seed area.
➤ Learn to involve in an open auction.	➤ Price fixation of seed cocoons and norms followed.
➤ Method of calculation of bill and money; Attending to the formalities of the seed cocoon market.	➤ Knowledge about market layout, functioning, payment, collection and cash receipts, etc.
➤ Packing the seed cocoons with labels of race, quantity, etc., and transportation in suitable containers.	➤ Packing and safe transportation of seed cocoons.
➤ Safe transport of seed cocoons (Time, Mode and Care).	
➤ Visit to seed area and seed cocoon markets to understand the functioning/activities	

10. Tools, equipments and chemicals required for a batch of 20 students.

1.	Electronic Weighing Machine	1 No.
2.	Microscopes	5 Nos.
3.	Plastic Perforated Crates/bins for cocoon packing	5 Nos.
4.	Blade/paper snapper	5 Pockets.
5.	Potassium Bicarbonate	250 g
6.	Microscopic slide	4 Pockets
7.	Cover Slip	5 Pockets
8.	Indian Ink	1 Bottle
9.	Glass rod	10 Nos.
10.	Seed Cocoons of multivoltines and bivoltines	5 kg each
11.	Calculator	5 Nos.
12.	Pestle and mortar (20 ml capacity)	20 no.
13.	Face mask, surgical hand gloves	20 sets

LEVEL – 3

1. Module Name:	Pupa and Moth Tester.	
2. Sector:	Sericulture	
3. Code:	SER - 323	
4. Entry Qualification	Minimum 10 th Standard and 16 years of age	
5. Terminal Competency:	Successful candidates would be able to carry out testing of silk worm pupa/silk moth for pebrine disease to produce disease free layings.	
6. Duration:	150 hours	
7. Preface:	The silkworm eggs should necessarily be free from pebrine disease. This disease is transmitted not only by contamination but also by transovarial transmission from the mother moth to eggs. This process ensures production of disease free laying (Dfls) Therefore, this module is important.	
8. Job Profile:	Employable as a moth tester in grainages and as pupa tester in seed cocoon markets.	
➤ Identification of different diseases of silkworm, Pebrinised pupae, moths and eggs.	➤ Pebrine disease and its importance and role of testing pupae and moths in disease free egg production.	
➤ Preparation of pupa and moth samples for testing.	➤ Methods of testing silk moth and pupa. Negative staining, positive staining, dipstick method.	
➤ Use of potassium bicarbonate in moth testing.	➤ Life cycle, causal organism, symptoms and preventive measures of Pebrine disease.	
➤ Use of mortar and pestle.	➤ Use of K ₂ CO ₃ in identifying the Pebrine spores.	
➤ Use of safety gadgets like masks, gloves and gumshoes.	➤ Important parts of female reproductive organs and external morphology of female moth and pupa.	
➤ Crushing the female moths after egg laying or pupa in mortar with the help of pestle.	➤ Preparation of samples for microscopic examination.	
➤ Individual and mass mother moth examination.	➤ Dipstick test (Immuno diagnosis).	
➤ Whole moth and wing base method of testing.		
➤ Negative and positive staining		

technique and identification of pebrine spores.	
➤ Method to take the smear on the glass slide and observe the slide under the microscope to examine for the presence or absence of Pebrine spores.	➤ Importance and maintenance of appliances and equipments used in grainage operation.
➤ Basic knowledge of microscope.	➤ Safe disposal Measures of grainage waste.
➤ Eco-friendly disposal of moths and pupae.	
➤ Discipline and punctuality	
➤ Visit to model grainage	

10. Tools, equipments and chemicals required for a batch of 20 students.

1.	Microscope	3 No.
2.	Moth Examination Table	5 No.
3.	Moth Crushing Set	20 No.
4.	Moth Examination stool	20 No.
5.	Microscopic Slide	5 Pocket
6.	Cover slip	5 pocket
7.	Washing Tray	3 No.
8.	Mask and Gloves	1 Set.
9.	Potassium Bicarbonate	250 g.
10.	Mortar and pestle	20 set
11.	Apron	1 Each
12.	News Paper	10 Kg.
13.	Refrigerator	1 No.

14.	Diesel Generator Set	1 No.
15.	Slide tray	5 No.
16.	Plastic Bucket with foot operated lid (15 lt.)	5 No.
17.	General disinfectant	5 lt.
18.	Indian Ink	5 vials
19.	Eosin stain	5 g
20.	Reagent bottles – (100 ml)	6 No.
21.	Water dropper bottle	6 No.

LEVEL - 2

1. Module Name:	Silkworm Egg Production Supervisor.
2. Sector:	Sericulture
3. Code:	SER - 324
4. Entry Qualification	Minimum of 10 th standard +SER 103 + SER 104 + SER 105 and 18 years of age, with computer knowledge
5. Terminal Competency:	After completion of the course, the trained person would be able to coordinate different activities of grainage and supervise egg production.
6. Duration:	150 hours
7. Preface:	The grainage operations require coordination at all the stages so as to get optimum productivity at the lowest expenses and to deliver the materials to the customers in time. Supervisor coordinates all aspects of grainage ranging from pre emergence to egg laying, moth testing and marketing of eggs. He supervises the availability of skilled labour for day - to - day work and he has to make arrangements for shortage of labour. Supervisor sorts out all kinds of discrepancies which may arise during egg production. Hence, this module.
8. Job Profile:	Employable in grainages
9. Course Content	
➤ Developing attitudes of friendly relationship with the employees of the grainage with mock drills.	➤ Functioning of grainage.
➤ Selection of good quality seed cocoons in conformation with the standard norms.	➤ Assessment of seed cocoons based on norms.
➤ Organizing sexing of cocoons, disposal of unselected cocoons.	➤ Storage of cocoons and infestation due to pest and predators.
➤ Coordinating the work of emergence, pairing, depairing, egg laying preservation of moths, and eggs.	➤ Moth emergence, pairing and depairing and egg laying.
➤ Coordinating the processing of	➤ Refrigeration of pupa and moth.
➤ To supervise sheet and loose egg production.	➤ Sheet and loose egg production.
➤ Surface disinfection of eggs.	➤ Individual and mass mother moth examination.

➤ To arrange for moth and pupa testing.	➤ Surface disinfection and advantages.
➤ To learn loose egg preparation and packing of egg cards.	➤ Loose egg preparation.
➤ Maintenance of registers and data book.	➤ Registers and data book.
➤ Eco friendly disposal.	➤ Eco friendly disposal.

10. Tools, equipments and chemicals required for a batch of 20 students.

10.	Silk worm production centre (Grainage)	
11.	Computer with internet connection and printer	1 set
12.	Calculator	1 No
13.	Land line telephone and mobile	1 No each
14.	Office furniture – 1 table, 4 chairs	2 sets
15.	Refrigerator (300 liter capacity)	1 No
16.	Ledgers and files	As needed
17.	Office stationery	As required

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LEVEL –3

- 1. Module Name:** Sericulture Extension Worker
- 2. Sector:** Sericulture.
- 3. Code:** SER - 325
- 4. Entry Qualification** Minimum 10th standard and 18 years of age
- 5. Terminal Competency:** Successful candidate would be able to demonstrate the new sericulture technologies to sericulturists.
- 6. Duration:** 100 hours
- 7. Preface:** Many scientific technologies have been developed in mulberry production and silkworm rearing by various research institutes. These new innovations should reach the farmers to improve their cocoon crop production and economic returns. Therefore, a well trained extension worker is very essential for popularizing new technologies among sericulturists.
- 8. Job Profile:** Employable in NGOs and can also take up consultancy.

9. Course Content

<ul style="list-style-type: none"> ➤ Practicing/learning new technologies of mulberry propagation, garden establishment and maintenance. 	<ul style="list-style-type: none"> ➤ Extension education- need, importance, objectives, principles and philosophy.
<ul style="list-style-type: none"> ➤ Acquainting the knowledge about mulberry diseases, pests and their preventive and control measures. 	<ul style="list-style-type: none"> ➤ Approaches of extension education – training approach, Self-help group approach and integrated development approach.
<ul style="list-style-type: none"> ➤ Learning the new technologies of chawki rearing and late age silkworm rearing. 	<ul style="list-style-type: none"> ➤ The Source-Message-Channel-Receiver-Effect communication Model.
<ul style="list-style-type: none"> ➤ Practicing the skill of using various farm implements, silkworm rearing appliances, sprayers and other gadgets used in sericulture. 	<ul style="list-style-type: none"> ➤ Extension teaching methods-Farm and home visit, method demonstration, training, visits to the progressive farmer's and research institutes and group meetings.
<ul style="list-style-type: none"> ➤ Acquainting the knowledge of different extension methods to disseminate the new technologies to sericulturists. 	<ul style="list-style-type: none"> ➤ Extension programme planning – Planning process – Analysis of the situation, identification of problems, determination of objectives, plan of work, execution, evaluation and reconsideration.
<ul style="list-style-type: none"> ➤ Learning/practicing the felt needs of the target groups to determine the priority areas and execute the plan of action in 	

stipulated time.	
➤ Learning the skills of maintaining the cordial relationship with target group and other officials involved in transfer of technology (TOT)	

10. Tools and equipments required for a batch of 20 students.

1.	Vehicle	1 No.
2.	Camera	1 No.
3.	TV	1 No.
4.	LCD Projector	1 No.
5.	Overhead Projector	1 No.
6.	Black board	1 No.
7.	Charts & photographs	As required
8.	Posters & pamphlets	As required
9.	CDs	24 No.

LEVEL - 4

1. Module Name:	Silkworm Egg Production Manager.
2. Sector:	Sericulture
3. Code:	SER - 426
4. Entry Qualification	Minimum of P.U.C + SER 324 and 20 years of age.
5. Terminal Competency:	After completion of the training, trained person would be able to work as manager in Egg production unit.
6. Duration:	150 hours
7. Preface:	A grainage needs to be managed well in order to work efficiently and effectively. The activities include the planning of purchase in line with the demand, ensuring quality at all levels, operating economically, planning and assigning works to the employees, managing the cash flow and maintaining the discipline, and ensuring the production of disease free layings.
8. Job Profile:	Egg Production Manager.
9. Course Content	
➤ Planning and organizing the activities of a grainage.	➤ Organizational structure of grainage.
➤ Taking stock of demand and purchase.	➤ Importance and imperatives of maintenance of cordial relation with the farmers and department officials.
➤ Developing cordial relationship with the farmers.	➤ Managerial aspects of assigning work to the lower cadres.
➤ Planning and arranging the manpower for different shift working (Day and Night)	➤ Timely maintenance of workers on shift basis.
➤ Maintaining indent book and quantity of eggs required for the particular duration.	➤ Importance and the aspects of Record maintenance with respect to demand and produce.
➤ Establishing cordial relation with the department officials.	➤ Purchase of different articles required for egg production.
➤ Procuring the materials needed for effective running of the grainage.	➤ Vigilance during individual and mother moth examination.
➤ To maintain the records of transactions and the activities as needed.	➤ Eco friendly disposal of waste materials.
➤ Assignment of work to the labourers by referring to their competency	➤ Skill of managing the administration and production of

levels and the job requirement.	disease free layings.
➤ Maintenance of pay roll.	
➤ Strict vigilance of pupa and moth testing.	
➤ To pay courtesy call to the house of rearers and to know the performance of crops.	
➤ To assist the farmers on basic ideas of egg transportation, incubation, block boxing etc.	
➤ Eco friendly nature of disposal.	

10. Tools and equipments for training 20 candidates

1	Grainage	1
2	Office room	1
3	Office furniture	1 set
4	Computer with internet connection and printer	1
5	Cupboard	2
6	Case studies of different grainages	10
7	Books and journals relating to legal aspects of grainage operations, rules and regulations	1 Set