There shall be two theory papers of 100 marks each and a Practical of 100 marks and a project work of 100 marks. The syllabus is based on 4 theory periods, 4 project periods and 15 Practical periods (each period of One hour duration).

**PAPER – I**
(Moriculture and Silkworm Biology)

1.0 **Introduction to Sericulture**
1.1 Sericulture : History and present status.
1.2 Silkworms : Types, host plants, mulberry and non-mulberry sericulture in India.
1.3 Silk production : Mulberry silk and non-mulberry silk production, Export and National income
1.4 Recent trends in Sericulture : Modernization of culture practices high yielding hybrid races of silkworm.

2.0 **Mulberry cultivation (Moriculture)**
2.1 Mulberry Tree : Characteristics, Mulberry varieties, Relationship between growth and environment, mulberry cultivation, sexual and Asexual propagation.
2.4 Plantation : Soil, water, manuring, Methods of plantation, management, Leaf production.
2.2 Mulberry diseases and Control : Red rust, common mulberry dwarf, mulberry wilt, leaf spot, powdery mildew, root knot (Nematode disease), control methods.
2.3 Mulberry pests and control : Leaf eating caterpillars, jassids, thrips, mealy bugs (Scale insect), gall midges, stem girdle beetle, powder pest beetle, and control methods.

3.0 **Silkworm Biology**
3.1 life cycle : Egg – shape, size and external structure, incubation period.
 : Larva- Instars, morphological characters, individual life span, sexual dimorphism in the last instar larvae.
 : Pupa- Male and Female pupae pupal period and sexual dimorphism
 : Adult- Male and female moths, adult life and sexual dimorphism.
3.2 Structure and function : Mouth parts of the larva, External genitalia of adults, Digestive system in larva, Circulatory system in larva, Reproductive system in larva and adults.
3.3 Silk gland : Morphological structure, Histological Differentiation, Functional differentiation, Silkgland secretory cycle and silk synthesis, degeneration, Silk proteins.
3.4 Neuroendocrines : Central nervous system, Neuroendocrine systems, Hormones in development, Pheromones.

4.0 **Silkworm protection**
4.1 Diseases : Pebrine, Grasserie, Flacherie, Muscardine
4.2 Control of diseases : Preventive measures
4.3 Insect pests and control
   : Uzi fly
   : Demisted beetle, Ants
4.4 Vertebrate pest and control
   : Lizards, Birds
   : Squirrels, Rats

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PAPER – II
(Sericululture Industry and Marketing)

1.0 Seed Production (Grainage)
   1.1 Seed Cocoons
       : Selection, preservation, incubation
       : Grainage Equipment.
   1.2 Moths
       : Emergence, mating, egg laying, infection examination.
   1.3 Eggs
       : Disease free egg laying (DFLs) preparation,
         Loose egg preparation. Egg preservation
   1.4 Egg hatching/Development
       : Embryonic development, Inhibition of embryonic development.
       Artificial hatching,(Hot and Cold acid treatment) Shipment of DFLs

2.0 Silkworm rearing
   2.1 Rearing method/ requirements
       : Selection of silkworm race for rearing
       Collection of Seeds (DFLs)
       Rearing Equipment,
       Rearing house (Model and Thatched Roof)
   2.2 Rearing requirements/ method
       : Disinfections of rearing house and appliances,
         Brushing of newly hatched larvae, Bed cleaning, Spacing and
         Dusting of disinfectants. Maintenance of
         temperature, photoperiod and humidity for rearing.
   2.3 Food and Feeding
       : Quality, harvesting and storage of mulberry leaves
       Feeding and rearing of early stage larvae.
       Feeding and rearing of late stage larvae.
       Schedule of feeding, artificial diet
   2.4 Cocoon formation and adult emergence
       : Ripening of worms, spinning of cocoon,
         Pre-pupal moulting, pupation and mounting of ripening worms.
       Types of mountages, harvesting of cocoons,
       Emergence of adult moths from cocoons,
       Inhibition of adult emergence for silk production.

3.0 Reeling of cocoons
   3.1 Cocoon preparations
       : Selection and preservation of cocoons for reeling,
       Drying/Stifling, Boiling, Top Boiling System,
       One Pan Boiling System, Three Pan boiling system,
       Sunkensystem, Brushing
   3.2 Reeling appliances
       : Country Charkha
       Cottage basin/Domestic machine
       Filature/Multiend machine
       Automatic reeling machine, Skeining unit
   3.3 Reeling methods
       : Charkha reeling,
       Cottage basin reeling
       Filature
   3.4 Reeling operations
       : Reeling, Re-reeling, Lacing
       Winding, Single and double twisting
       Steaming, Twist reeling,
       Book press, Storage of yarn

4.0 Marketing
4.1 Cocoon marketing: Gradation of seed and reeling cocoons. Marketing of multivoltine, bivoltine and hybrid cocoons.

4.2 Yarn marketing: Gradation of yarn Twisted/untwisted yarn Marketing of yarn

4.3 Silk marketing prospects: Indian Market, International market, Foreign exchange earning

4.4 Cost benefit ratio: Cost of land and soil preparation. Cost of mulberry plantation and Management, Cost of silkworm rearing, Reeling of yarn, Selling of the cocoons / yarn, Netprofit.

PRACTICAL    (Marks 100)


2. Preparation of land and mulberry sowing Ploughing, weeding, and leveling of land, manuring, methods of cutting (pruning), and transplantation of cutting into nursery and management, plantation methods, irrigation, doses of fertilizer, management of plantation.

3. Field collection
   a) Diseases: Leaf spot, Powdery mildew, root knot, red rust, mulberry wilt.
   b) Pests: Leaf eating caterpillar, Jassids, Thrips, Stem girdle beetle.
   c) Non-mulberry silkworm: Stages of lifecycle and cocoons.

4. Preparation of life cycle of different races of silkworm, Bombyx mori
   Multivoltine races: Pure Mysore, Nistari, Hosa Mysore
   Bivoltine: NB7, NB18, NB4D2, KA.
   Hybrid: PM X NB7, PM X NB18, PM X NB4D2, PM X KA, NB7 X NB7, NB18 X KA, PM X CSR2

5. Rearing of silkworm and harvesting of cocoons Disinfections, young age rearing, late age rearing, feeding, cleaning, spacing, dusting, moulting, determination of leaf, cocoon ratio, mountage, spinning and harvesting of cocoons.

6. External morphology and Sexual dimorphism in Larva, pupa and adults

7. Identification of internal organs of silkworm Digestive system, Silk gland, Heart (Circulatory System), Central nervous system, Reproductive system of larva and adult, Mouth parts of larva

8. Silkworm seed production Selection and preservation of seed cocoons, sexing, regulation of mating, Mother moth examination, DFLs preparation, preparation of card and loose eggs and washing of eggs, hot and cold acid treatment.

9. Identification of embryonic growth in egg Stage of fertilization, blastoderm, germ band, spoon-shaped embryo, black head stage (4 – 10 days).

10. Identification of diseases and pests of silkworm and control strategy Diseases: Protozoan disease-pebrine (Nosema bombycis), Viral disease- Grasserie (NPV and CPV),
Bacterial disease-Flacherie (Cocoi and Bacillus), Fungal disease- Muscardine (Red, White and Green) (Beauvaria bassiana).
Insect Pests: Uzi fly (Tricholyga bombycis), Dermestid beetle, Ants.
Vertebrate Pests: Lizards, Rats, Squirrels and Birds.
Mechanical and Chemical Control.

11. Process of reeling
   Cocoon drying/stifling, cocoon boiling, brushing, reeling, re-reeling, finishing and testing, winding, twisting, doubling, double twisting, steaming and twist reeling.
12. Market study with reference to silk cocoons, yarn and silk fibre.
13. Study tour.

**SCHEDULE OF PRACTICALS AND DISTRIBUTION OF MARKS**

The Practical comprises of two parts:

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<thead>
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<th>Part –I</th>
<th>Project work</th>
<th>Internal assessment</th>
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<th>Part –II</th>
<th>Practical (6 hours duration)</th>
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<td>a) Dissection</td>
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<td>b) Identification of silkworm pathogens</td>
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<td>c) Identification and comments on the spots (1-10)</td>
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<td>d) Characteristics of mulberry leaves of different varieties</td>
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<td>e) Determination of stomatal frequency on mulberry leaves</td>
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<td>f) Demonstration of reeling and production of yarn</td>
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<td>g) Class Record</td>
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Project + Practical = 100 + 100 = 200