Course Title: AN EXPOSURE TO SERICULTURE

COURSE DURATION: 6 months **(Weekly 1-2 classes within the college hours)**

TARGET GROUP: College Students

This course is designed for individuals with little to no prior experience with sericigenous insects, aiming to equip them with fundamental sericultural skills for personal and professional use.

COURSE: Basic Training on Sericulture Fundamentals

TARGET CANDIDATE: No upper limit.

CANDIDATE COURSE FEES: Free

TEACHING METHOD: Offline mode

LEVEL OF KNOWLEDGE: Beginner

ABOUT THE COURSE :

Description:

The syllabus for Sericulture at undergraduate Major (6 months course) has been framed in accordance with the model syllabus given by the Department of Sericulture. The main objective of framing this new syllabus is to give the students a thorough understanding of the subject giving adequate weightages to both the core content and techniques used in Sericulture. Keeping in mind and in tune with the changing nature of the subject, adequate emphasis has been given on new techniques and understanding of the subject. The syllabus has also been framed in such a way that the basic skills of subject are taught to the students, and everyone might not need to go for higher studies and the scope of securing a job after graduation will increase. There is wide deviation in the infrastructure, be it physical or in human resource, in the form of teachers' expertise and ability and aspiration of the students. Hence, Project Work has also been introduced as one of the alternatives for continuous evaluation and for the merit of the dissertation.

Objective:

To empower participants with foundational sericulture skills, enabling them to navigate modern seri – biotechnological skills.

Learning Outcome:

By the end of the course, participants should be able to:

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2. Use common seri – biotechnology practical applications for basic tasks.

3. Understand and apply fundamental concepts of non – mulberry sericulture, genetics and breeding of mulberry and silkworm, extension education system and entrepreneurship development programme.

Medium of Interaction: English

Eligibility: No specific educational background is required. This course is open to any student with a desire to learn basic biological skills.

Technical Requirements:

Participants must carry pen / copies / sheets of papers during course hours.

CO-ORDINATORS OF COURSE :

DR. SWAPNA BANERJEE (ASSOCIATE PROFESSOR)

KRISHNENDU DAS (SACT II)

MADHUJOYA DASGUPTA (SACT II)

MRITTIKA SENGUPTA (SACT II)

COURSE PLANNING:

Month 1: GENERAL SERICULTURE

Module 1. (10 hrs = 10 classes)

Unit 1. Introduction to Sericulture: Origin and history of sericulture. Silk route and map of India and World; Temperate and tropical climate for sericulture practice.

Unit 2. Environmental impact of sericulture: Eco-friendly activity of sericulture; Employment generation in sericulture and role of women in sericulture.

Unit 3. Characteristics of sericulture industry: Land and agro based part of industry. Industrial aspect of the industry; Silk reeling as a cottage industry;

Handloom and power loom activities.

Unit 4. Prospects and problems of sericulture industry

Unit 5: SWOT Analysis of Sericulture industry

Month 2: BIOLOGY OF SILKWORM AND MULBURRY

Module 2. (14 hrs = 14 classes)

Unit 1: Silkworm taxonomy & life-cycle.

Unit 2: Races & classification of silkworm: Classification based on the number of Larval Moults, Moultinism and Voltinism. Indigenous pure race& cross breed of India. Races with sex limited Characters

Unit 3: Silkworm morphology: Morphology of the egg, larva, pupa, adult.

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Nervous system: Larva, adult, Silk gland: Larva, Reproductive system: Adult.

Unit 5: Biology of Mulberry: Botanical description of mulberry. Economic importance of mulberry Plant; Salient features of family Moraceae; Phyto-geography and systematic of the genus Morus L. and its species; Morphology of mulberry plant; Different cultivars of mulberry; Floral biology of mulberry: Structure of male and female flowers, catkins

Unit 6: Anatomy of mulberry: Stem, root, leaf lamina

Unit 7: Mulberry crop protection: Planting system, pruning and training, propagation, irrigation, fertilizer application, manuring, composting, vermicomposting weeding method

Month 3 : MULBERRY AND SILKWORM CROP PROTECTION & SILKWORM REARING AND REELING

Module 3. **(15 hrs = 15 classes)**

Unit 1: Diseases of mulberry Leaf: Leaf spot, Powdery mildew, Leaf Rust, Leaf blight

Unit 2: Diseases of mulberry root: Root rot disease, Root knot disease

Unit 3: Mulberry pest management (Major Pest) (Pest Definition, Pest Outbreak, Pest Forecasting) : Mealy bug, Bihar hairy caterpillar, Jassid, Leaf roller, Scale insect and Thrips: their preventive and control measures. Minor Pest: Termites and mites their preventive and control measures.

Unit 4: Silkworm Diseases: Protozoan disease, Bacterial disease, Fungal disease, Viral disease, Sotto disease, septicemia, galtine.

Unit 5: Silkworm Pests: Uzi fly, Ants, Dermestid Beetles.

Module 4. **(20 hrs = 20 classes)**

Unit 1: Silkworm Rearing (C.S.B. proposed model rearing house)

Unit 2: Rearing appliances, disinfection, disinfectants, bed cleaning, feeding of worms

Unit 3: Maintaining optimum condition of rearing, brushing, frequency of spacing, care during mounting

Unit 4: Mounting and mountage, process of spinning, cocoon harvesting

Unit 5: Rearing method: chawki rearing or young age worm rearing and Late age Silkworm rearing.

Unit 6: Cocoon stifling (sun drying, steam stifling, hot air stifling), storage of cocoon, sorting of cocoons

Unit 7: Deflossing, cocoon riddling, mixing or blending, cocoon cooking, brushing

Unit 8: Concept of difference reeling machines, reeling operation, reeling end formation

Unit 9: Degumming, bleaching, dyeing of silk yarn

Unit 10: Twisting, Reeling, Re-reeling, lacing, skeining and testing of raw silk material and Weaving of silk.

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Month 4 : SILK TECHNOLOGY & SERICULTURE EXTENSION EDUCATION

Module 5. **(10 hrs = 10 classes)**

Unit 1: General classification of textile fibers. Difference between nature and synthetic fibers according to their composition and properties.

Unit 2: Identification of Silk Textile Fibers by Physical and Chemical Test: Microscopic Examination, Flame Test, Solubility Test

Unit 3: Longitudinal and cross section view of silk textile fibers and their impact on physio-mechanical properties like tenacity, elongation toughness, elastic recovery and moisture absorption.

Unit 4: Introduction and Objective of Degumming Methods. Silk Bleaching, Importance and Processing, Silk Dyeing – Acid and Basic Dyeing Processing. Introduction of Different Classes of Dyes and Chemicals used for Silk Dyeing.

Unit 5: Printing of Silk Fabrics: - Objective, Method -Hand and Screen Printing. Silk Finishing: Objectives, Methods - Mechanical and Chemical Finishing

Module 6. **(7 hrs = 7 classes)**

Unit 1: Meaning, objective and importance of sericulture extension. Principle and concept of extension education

Unit 2: Extension programme: concept and principle, role of extension personnel and farmers in programme planning, transfer of technology

Unit 3: Training: different methods of training, teaching aids.

Month 5 : NON - MULBERRY SERICULTURE

Module 7. **(12 hrs = 12 classes)**

Unit 1: Scope of Non-mulberry sericulture and mulberry vs. non-mulberry sericulture

Unit 2: Non-mulberry silkworms (Tasar, Muga, Eri silk) and their distribution in India and other countries

Unit 3: Taxonomy of food plants of non-mulberry silkworms: Salient feature of the families of non- mulberry silkworm

Unit 4: Cultivation of primary food plants of Tasar, Muga and Eri silkworms: *Terminalia arjuna*, *Machilus bombycina*, *Ricinus communis*

Unit 5: Life cycle of Tasar, Eri and Muga silkworm. Brief account of implant disease and pest of primary non-mulberry food plants and their management.

Unit 6: Disease of non-mulberry silkworms. Protozoan, bacterial viral and fungal diseases, symptoms, causative agent preventive and control
measures.

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Month 6 : SERICULTURE ECONOMICS, MARKETING AND ENTREPRENEURSHIP DEVELOPMENT

Module 8. **(12 hrs = 12 classes)**

Unit 1: Advantages and characteristics of sericulture. Scope of sericulture in India – Vis-à-Vis other agricultural crops - income and employment generation.

Unit 2: Economics of mulberry production under rain-fed and irrigated systems; comparative economics of mulberry production under traditional and improved practices.

Unit 3: Economics of raw silk production in charka, cottage basin and multi-end reeling units.

Unit 4: Sericulture markets and their kinds. Marketing problems of silk industry

Unit 5: Law of demand and supply price determination, problems of cocoon market, role of silk exchange.

Unit 6: Marketing of cocoons and by-products. Regulated cocoon market. Non-regulated cocoon market.

Unit 7: Entrepreneurship Building: Meaning, Importance, Psychological, Sociological factors and distinctive competence. Entrepreneurship processes.

Unit 8: Need, scope, characteristics and types of Entrepreneurship.

Unit 9: Social responsibility and business ethics

Unit 10: Human resource management; Leadership, Motivation attitude, communication, Group dynamics, Dedication, Setting of goals, self-assessment Transactional analysis, Creativity.

Unit 11: Problem solving, Strength weakness opportunity and threat (SWOT) Techniques; Decision making, Stress management; Reinforcement, recruitment, selection and training.

Unit12: Sericulture organizational setup: central silk board, RSRS, KVK, NGOs, and universities.

Throughout the Course: Practical Projects and Assessments

Regular practical assignments to reinforce learning.

Mini projects integrating various skills learned

Practical class **(30 classes = 30 hrs.)**

LIST OF PRACTICAL

1. Sericulture maps : a) World maps and Silk Road b) Sericulture map of India and West Bengal

2. Preparation of histograms and pie charts on:- a) Production of Textile fibers in India b) World Silk Production c) Pie chart on mulberry and non-mulberry silk production in India.

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3. Identification and study of Sericulture products : Cotton and Silk Yarn different types, Pupae, Silk Yarn, Noil Yarn, Morphology of egg, larva, pupa and adult of silkworm Bombyx mori, pest and Predators of silkworms, Rearing Appliances , Identification of common weeds of mulberry , Identification of bacterial, viral and minor diseases and their symptoms , Identification of root knot disease in mulberry , Identification of mulberry pests, study of nature of damage of the following pests:- Bihar hairy caterpillar, scale insect, mealy bug, Jassid, thrips, beetles and grasshopper , Identification of Tasar, Eri and Muga , Identification of silk, cotton, wool and synthetic fiber (nylon/polyester)

4. Different propagation methods – seedling , grafting and layering.

5. Determination of good cocoon and defective cocoon percentage , Determination of silk ratio percentage and estimated of Rendition , Epprouvatte reeling and determination of average filament length and filament denier.

6. Visit to rearers house and panel discussion with farmers

7. Presentation of statistical data – Bar Chart and Graph, Pie Chart of raw silk, cocoon area .

8. Visit of cocoon market and demonstration..

9. Maintenance of records for silkworm rearing/Internal Assessment/Local silkworm rearing field visit.

10. EDP in raising mulberry saplings (Kisan nursery) and vermicomposting , EDP in organization of chowki rearing centers. , EDP in silkworm egg production and rearing. , EDP in silk reeling – charka, cottage basin and multi-end reeling units. and EDP in mass production of parasitoids and predators.

Certification:

Certificate awarded based on over all performance through departmental class test for every module of course by the college.

Class number and hours distribution /Module

Module	Hours	Class
One	10	10
Two	14	14
Three	15	15
Four	20	20
Five	10	10
Six	07	07
Seven	12	12
Eight	12	12
Total	100	100

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LEARNING RESOURCES

SL. NO.	TITLE OF THE BOOK	AUTHOR(S)	PUBLISHER
1.	An introduction to sericulture	G. Ganga and J. Sulochana Chetty	Oxford and IBH Publishing CO. Pvt. Ltd.
2.	A comprehensive guide to sericulture	Frank Jackson	Oxford and IBH Publishing CO. Pvt. Ltd.
3.	Handbook of Entomology	T.V. Prasad	New Vishal Publications, 3rd edition
4.	Silkworm Breeding Made Easy	Sham S. Misri and A. K. Misri	IBH Publishing CO. Pvt. Ltd.

EVALUATION POLICY FOR THE ADD-ON COURSE

The basic philosophy behind the Evaluation policy for this 100 Hours Add-on course is to objectively judge the participants (students) whether the concepts were understandable to them or not and whether they could apply these concepts to solve numerical and conceptual problems. The Evaluation would be done through 2 components –

- C1 Course-end Assessments (Written Test) [Total Marks: 50]
- C2 Practical /LAB [Total Marks: 10]

Total Marks of the Evaluation process would be – 50 Marks

TABLE F OR QUALIFICATION

TOTAL SCORE (OUT OF 50)	GRADE
45 – 50	O – OUTSTANDING
40 – 44	E – EXCELLENT
35 – 39	A – VERY GOOD
30 – 34	B – GOOD
25 - 29	C - FAIR
BELOW 25	F - FAILED

GENERAL RULES AND REGULATIONS

1. Students must attend and appear for all the Module-End Assessments. If any student fails to submit any of the Module-End Assignments or fails to attend any of the Module End Assessment examinations , the particular Student would NOT BE ELIGIBLE FOR CERTIFICATE.
2. Students must attend and appear for the Course-End Assessment Examination. If any student fails to submit the Course-End Assessment or fails to attend the Course-End Assessment Examination , the particular Student would NOT BE ELIGIBLE FOR CERTIFICATE.
3. Students must attend and appear for the Course-End Viva. If any student fails to fails to attend the Course-End Viva, the particular Student would NOT BE ELIGIBLE FOR CERTIFICATE.
4. Total Marks of Course Evaluation will be 50 Marks.
5. Minimum 50% Marks has to be scored to receive any Certificate. There will be only ONE Attempt allowed for each of the Module-End Assessments and the Course-End Assessment.
6. There will be NO PROVISION for Backlog Clearance.
7. General Rules and Regulations of the College must be followed without any exception.
8. Minimum 75% attendance is required to receive the certificate of the course.

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