(National Education Policy – 2020)

Curriculum Structure and Syllabus for Under Graduate Program

in

SERICULTURE

(Eight Semester course)

(With effect from the session 2023–2024)

University of Kalyani,

Kalyani, W.B.

India

The Under Graduate syllabus in Sericulture under NEP system (2023-2024) has been placed in the meeting of Board of Postgraduate Studies (UGBOS) in Sericulture held on 19.06.2023. The members of UGBOS restructured and recommended the syllabus and the same was subsequently submitted to the Secretary, UG, University of Kalyani, for approval from the Faculty Council and Executive Council of the University. The Faculty Council of the University of Kalyani approved the syllabus on ……. The approved syllabus will be placed in the subsequent meeting of the Executive Council of the University for final approval.

Prof. (Dr.) Kausik Mondal

Chairman,

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Kalyani, W.B.
India

UG syllabus in Sericulture, NEP system, University of Kalyani

Preamble

Sericulture, an applied science dealing with rational management of activites to produce of silk, an exquisite natural fibre. It covers all operations required to rear silkworm and extraction of silk having both on farm and off farm acivities.

Indian silkworm breeds are basically multivoltine. Huge progress has been achieved in the productivity of mulberry and silkworm breeds over the years. Adoption of HY mulberry and silkworm hybrids along with technology innovation has made tremendous improvement in production has made sericulture a lucrative avocation. With theses success more people are adopted sericulture as oppertunity for additional income. More and more areas are coming under mulberry with active support from the Government. Though, India is the second largest producer of silk, however, its contribution to the world raw silk production is only 15%. Still there is abundant oppertunity to extend further due to strong international demand and huge domestic comsumption.

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, thus make them employable. Further there are scope for self employment and entreprenourship development.

The entire under graduate course in Sericulture of this University is designed to impart knowledge about subject in a phased manner. The course offers Core, Ability Enhancement Compulsory, Discipline Specific (Major), and Discipline Specific (Minor) papers including practical for Core and Discipline Specific papers for students of the disciplines.

With the advancement of knowledge in this branch of science, augmented with phenomenal discoveries directly associated with human welfare, the subject is gaining tremendous attraction from the society and wide range of students.

The curriculum is a holistic approach to establish a better teaching-learning platform in Sericulture for the students, the teachers, and to generate tarined manpower to feed the seri industry and towrds entrepreneurship development

Programme Objectives:

The Undergraduate programme in Sericulture aims to equip students with recent advances in Sericulture techniques and industries. It also aims to empower students to understand the challenges of society and the country that falls into the realms of Sericulture, such as mulberry cultivation, silkworm rearing, silk reeling, weaving and marketing.

UG syllabus in Sericulture, NEP system, University of Kalyani

Keeping with the spirit of NEP, different courses are offered to the students, like Major (theory and practical), Minor, Multidisciplinary Courses, Value Added Courses and Ability Enhancement Compulsory courses. The undergraduate course is designed to ignite inquisitive minds about learning the basics as well as the advances in Sericulture and is open for admission to students who have studied Biological science, along with Physic, Chemistry and allied subjects in their class 10+2 stage.

Programme Specific Outcomes:

Student after successfully completing semesters of Undergraduate programme would sufficiently be skilled and empowered to solve the problems in the realms of Sericulture and its allied areas. They would have a plethora of job opportunities in the Sericulture sectors and entrepreneurship. The bright and ignited mind may also enter into research in the contemporary areas of Sericulture. The broad skills and deeper knowledge in the field would make them highly successful and excellent researchers in advanced areas of research in Sericulture.

COURSE STRUCTURE SERICULTURE (NEP-2020)

Department of Sericulture, University of Kalyani

With Effective from 2023-2024 Session

SEMESTER I

Course Code	Course title	Nature of Course	Credit of Course	Class hour/week	Evaluation		Total
					In-Semester	Semester End	
SER-MJ-T-101	Introductory sericulture: Taxonomy, distribution and biology of Mulberry	Major	4	4	15	40	55
SER-MJ-P-101	Introductory sericulture: Taxonomy, distribution and biology of Mulberry	Major	2	2		20	20
SER-MI-T-101	Zoology Or Botany	Minor	4	4	10	40	50
SER-MU-T-101		Multidiscipliy Course	3	3	10	35	45
SER-SEC-T-101	Vermicomposting & it's Application	Skill Enhancement Course	3	3	10	35	45
SER-VA-T-101	Environmental Education	Value Added Course	4	4	10	40	50
05			**20**	**20**	**55**	**210**	**265**

SEMESTER II

Course Code	Course title	Nature of Course	Credit of Course	Class hour/week	Evaluation		Total
					In-Semester	Semester End	
SER-MJ-T-201	Taxonomy, distribution and biology of the silkworm, Non-mulberry (Vanya) silk	Major	4	4	15	40	55
SER-MJ-P-201	Biology of silkworm	Major	2	2		20	20
SER-MI-T-201	Zoology/ Botany	Minor	4	4	10	40	50
SER-MU-T-101		Multidisciplinary Course	3	3	10	35	45

AECC-201	Communicative English	Ability Enhancement Course	4	4	10	40	50
SER-SEC-T-201	Establishment of kisan Nursery	Skill Enhancement Course	3	3	10	35	45
SER-SI--201	**Summer Internship (Additional for Certificate/Diploma)**	**Summer Internship**	**4**	**4**			
05			**20**	**20**	**55**	**210**	**265**

UG syllabus in Sericulture, NEP system, University of Kalyani

Abbreviations used in the syllabus:

SER-MJ- T – Sericulture Major Course Theory

SER-MJ- P – Sericulture Major Course Laboratory

SER-MI-T – Sericulture Minor Course Theory

SER-MU-T – Sericulture Multidisciplinary Course Theory

SER-SEC-T - Sericulture Skill Enhancement Course Course Theory

SER-VA-T - Sericulture Value Added Course Course Theory

AECC - Ability Enhancement Course

SER-SI - Summer Internship (Additional for Certificate/Diploma)

Examination Pattern

Course	**In-Semester**	**Semester End**	**Total Points**
Theory (Major)	15 Attendance (5) Internal Assessment (10)	40	**55**
Practical (Major)		20 Practical + Viva Voce (15 + 5)	**20**
Theory (Minor)	As per Minor Paper of Zoology/ Botany	As per Minor Paper of Zoology/ Botany	
Theory (Multidisciplinary Course)	As per University Rules	As per University Rules	
Theory (Skill Enhancement Course)	10 Attendance (5) Internal Assessment (5)	35	**45**
Theory (Value Added Course)	As per University Rules	As per University Rules	
Theory (Ability Enhancement Course)	As per University Rules	As per University Rules	
Summer Internship (Additional for Certificate/Diploma)		50	**50**

*Attendance: 90-100%=5, 80-89%=4;70-79%=3;60-69%=2; Less than 60%=

Question Pattern

In-Semester	Semester End Examination
For written test only For 10 points: 2Pt. × 5(out of 6)	**For 35 Points:** $2^{1/2}$ptx4 (out of 6)=10 5 ptx3 (out of 5)=15 10 ptx1 (out of 2)=10
	For 40 Points: $2^{1/2}$ptx2 (outof 3)=5 3 ptx3 (out of4)=9 5 ptx2 (out of3)=10 8 ptx2 (out of3)=16

Semester wise Detail Syllabus of Under Graduate in Sericulture Course & Course Credit

SEMESTER I			
SER-MJ- T-101 : Introductory sericulture: Taxonomy, distribution and biology of Mulberry	**Credit of Course**	**Class hour/week**	**Points**
UNIT – I Introductory Sericulture: 1. Sericulture: Origin, history and spread. 2. Types of silks. 3. Life cycle of silkworm. 4. Silk route and sericultural map of India and the World. Production statistics. 5. Progress of seri industry through different plan periods. 6. Silk and its trade. 7. Employment generation potential: women empowerment and tool for rural development through sericulture 8. Development of entrepreneurship **UNIT- II Characteristics of the Sericulture industry:** 1. Land and agro-based industry 2. Textile fibres: Natural and Synthetic fibres: Advantage of silk fibre over other fibres 3. International and domestic demand of silk 4. Function of Central Silk Board; Role of State Departments; Role of universities and NGOs in sericulture development. 5. Prospects and problems of sericulture industry in India, **UNIT-III: Taxonomy, Distribution and Biology of Mulberry :** 1. Distribution and Systematics of the genus *Morus* L. 2. Salient features of family Moraceae. 3. Morphology of mulberry plant; Anatomy of leaf and root. 4. Floral biology: Structure of male and female flowers, catkins. 5. Evolved and high-yielding cultivars of mulberry. 6. Overview of propagation techniquies of mulberry.	4	4	**55**

SER-MJ- P-101 : Introductory sericulture : Taxonomy, distribution and biology of Mulberry	**Credit of Course**	**Class hour/week**	**Points**
1. Sericultural 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 3. Identification of different parts of Mulberry 4. Study of the section of root, leaf . 5. Study of types of flower.	2	2	20
SER-MI- T-101 : Zoology/ Or Botany	**Credit of Course**	**Class hour/week**	**Points**
Take any one of minor paper from Zoology or Botany minor	4	4	50
SER-MU- T-101 : Multidisciplinary Course	**Credit of Course**	**Class hour/week**	**Points**
As per University syllabus of Multidisciplinary Courses	3	3	45
SER-SEC- T-101 : Vermicomposting & it's Application	**Credit of Course**	**Class hour/week**	**Points**
Unit -I: Introduction to vermiculture 1. Vermiculture - definition, meaning, history, economic importance, role in maintenance of soil structure, role as four r's of recycling (reduce, reuse, recycle and restore). 2. Role in bio transformation of the residues generated by human activity and production of organic fertilizers. 3. Humus cycle (product, qualities). ground population, transformation process in organic matter. 4. Earthworms, local and exotic species of earthworms; complementary activities of auto-evaluation; key to identifying the species of earthworms.	3	3	45

Unit -II: Biology of *Eisenia fetida* 1. Reproduction of Lumbricidae. 2. Vital cycle of *Eisenia fetida*: alimentation, fecundity, reproducing potential and limiting factors (gases, diet, humidity, temperature, PH, light, and climatic factors). 3. Complementary activities of auto evaluation. **Unit-III: Biology of *Eudrilus eugeniae*** 1. Taxonomy reproduction of Eudrilidae. 2. Vital cycle of *Eudrilus eugeniae*: alimentation, fecundity, reproduceing potential and limiting factors (gases, diet, humidity, temperature, PH, light, and climatic factors). 3. Complementary activities of auto evaluation. **Unit-IV: Vermicomposting** 1. Small-scale earthworm farming for home gardens 2. Commercial vermicomposting- pit, brick and, heap systems, and Kadapa slab method). 3. Earthworm farming, vermicompost harvest and processing. Vermiwash collection and use 4. Enemies of earthworms, sickness and worm's enemies; frequent problems – prevention and fixation. Complementary activities of auto evaluation. **Unit-V: Applications of vermiculture** 1. Benefits of vermicompost. 2. Basic characteristics of earthworms suitable for vermicomposting. 3. Problems in vermicomposting, vermicomposting of sericultural and dairy waste.			
SER- VA-T-101 : Environmental Education	**Credit of Course**	**Class hour/week**	**Points**
	4	4	50
Total Courses : 05	**Total Credit of Course : 20**	**Total Class hour/week : 20**	**Total Marks : 265**

SEMESTER II			
SER-MJ- T-201 : Taxonomy, distribution and biology of the silkworm, Non-mulberry (Vanya) silk	**Credit of Course**	**Class hour/week**	**Points**
Unit I: Biosystematics (taxonomy) of Silkworm and life-cycle. 1. Distribution of sericigenous insects. 2. Salient features of orders belonging to sericigenous insects. 3. Biology (life cycle) of silkworms and growth stages. 4. Overview of Non-Mulberry (Vanya) silkworms. **Unit II: Races & classification of silkworm, *Bombyx mori***: 1. Geographical races ; Classification based on Moultinism and Voltinism. Indigenous pure races 2. Exotic breeds and Evolved breeds and high-yielding cross breeds. **Unit III: Morphology and Anatomy**: 1. Morphology of the egg, larva, pupa, and adult. 2. Digestive system ; nervous system ; respiratory system of Larva 3. Reproductive system of moth. 4. Silk gland ; structure and function. **Unit IV: Overview of Non-mulberry (Vanya) silk** 1. Distribution of Non-mulberry (Vanya) silkworms in India. 2. Primary and secondary food plants of eri, muga and tasar silkworms. 3. Life cycle of eri, muga and tasar silkworms. 4. Salient features of cocoon characters of eri, muga and tasar.	4	4	55
SER-MJ-P-201 : Biology of silkworm	**Credit of Course**	**Class hour/week**	**Points**
1. Identification of Life Cycle stages of *Bombyx mori*. a) Morphology of egg, larva, pupa and adult of silkworm *Bombyx mori*. b) Sexual dimorphiism of larva, pupa and adult of silkworm *Bombyx mori*: **2.** Anatomy of Silkworm	2	2	20

a) Dissection of Digestive and respiratory nervous system. b) Mounting of larval mouth parts and spiracle. c) Silk gland dissection and mounting. d)) Reproductive system of male and female moths 3. Cocoon characters. a) Study of the Cocoon characters of multivoltine and bivoltine breeds of *B.mori*. b) Study of the Cocoon characters of tasar, eri and muga cocoons.			
SER-MI- T-201 » Zoology/ Botany	**Credit of Course**	**Class hour/week**	**Points**
	4	4	50
SER-MU-T-101 : Multidisciplinary Course	**Credit of Course**	**Class hour/week**	**Points**
As per University syllabus of Multidisciplinary Courses	3	3	45
AECC-201 : Communicative English	**Credit of Course**	**Class hour/week**	**Points**
As per University syllabus of Communicative English	4	4	50
SER-SEC-T-201: : ORGANIC FARMING			
Unit-I: Organic manures 1. Nutrient requirements in organic farming; limiting nutrient losses. 2. Manures – definition, Bulky Organic Manures (BOM), Concentrated Organic Manures (COM). 3. Organic manures: Farm Yard Manure (FYM), Enrichment of FYM. 4. Compost, methods of composting (Bangalore, Indore, Coimbatore, NADEP methods). **Unit-II: Green manures** 1. Green manuring, Classification of green manures (GM). 2. Nutrient status of various green manures. 3. Advantages of GM, Desirable characteristics of leguminous GM crops.	3	3	45

4. Recycling of organic residues, Classification of organic residues. **Unit-III: Soil amendments** 1. Soil improvements and soil amendments. 2. Salinity, alkalinity, acidity, types of amendments. 3. Reclamation of problematic soil using organic manures. **Unit-IV:Biodynamic formulations** 1. Biodynamic agriculture, biodynamic formulation-500(BD-500) – method of preparation and application. 2. Biodynamic formulation 501(BD-501); Cow-pat pit (CPP) – preparation and application. **Unit -V : Bio-fertilizar.** 1. Potash mobilizing and Sulphur mobilizing microorganisms; Arbuscular mycorrhizal fungi. 2. Azatobacor ; nitrogen fixing microbes their use. 3. Growth promoting substance excreting microorganisms – methods of application. 4. Use of bio-fertiliser with special reference to mulberry production. **Unit-VI: Organic preparations** 1. Preparation and application of beejamruta, sanjivak and amritpan 2. Preparation and application of panchgavya and dashagavya 3. Preparation of different types of compost including industrial waste, coir waste, press mud. 4. Government interventions to promote organic farming: NPOF, NPMSHF, NHM, RKVY, KVK and APEDA			
SER-SI- -201: Summer Internship (Additional for Certificate /Diploma)	**4**	**4**	
Total Courses : 05	**Total Credit of Course : 20**	**Total Class hour/week : 20**	**Total Marks : 265**