



# **BENGALURU CITY UNIVERSITY**

**CHOICE BASED CREDIT SYSTEM**

**(as per SEP 2024)**

## **Syllabus for I & II Semester Sericulture**

**2024-25**

# BENGALURU CITY UNIVERSITY BENGALURU

## ACADEMIC CURRICULUM AND UNDER GRADUATE SYLLABUS OF SERICULTURE UNDER NEW STATE EDUCATION POLICY - 2024 (DURATION OF THE COURSE: 3 YEARS/6 SEMESTERS)

**B.Sc. UNDER GRADUATE SYLLABUS OF I AND II SEMESTER IN SERICULTURE**

**L:T:P = 3:0:2**

Semester	Course	Title of the Paper	Instruction Hrs (L:T:P) /Week	Credit	Duration of Exam (Hrs.)	Marks		Total Marks
						IA (C1 + C-2)	Final Exam (C-3)	
<b>DISCIPLINE SPECIFIC CORE (DSC) COURSE</b>								
<b>I</b>	<b>DSC-1 (SER) A THEORY</b>	<b>MULBERRY AND SILKWORM BIOLOGY</b>	<b>4:0:0</b>	<b>3</b>	<b>3</b>	<b>10+10</b>	<b>80</b>	<b>100</b>
	<b>DSC-1 (SER) A PRACTICAL</b>	<b>MULBERRY AND SILKWORM BIOLOGY</b>	<b>0:0:3</b>	<b>2</b>	<b>3</b>	<b>05+05</b>	<b>40</b>	<b>50</b>
<b>II</b>	<b>DSC-2 (SER) B THEORY</b>	<b>MULBERRY CULTIVATION AND SILKWORM REARING</b>	<b>4:0:0</b>	<b>3</b>	<b>3</b>	<b>10+10</b>	<b>80</b>	<b>100</b>
	<b>DSC-2 (SER) B PRACTICAL</b>	<b>MULBERRY CULTIVATION AND SILKWORM REARING</b>	<b>0:0:3</b>	<b>2</b>	<b>3</b>	<b>05+05</b>	<b>40</b>	<b>50</b>

<b>I SEMESTER</b>		
<b>DSC-1 (SER) A : MULBERRY AND SILKWORM BIOLOGY</b>		
<b>THEORY</b>		<b>3Hrs/ Weeks X 16 Weeks=64 hrs.</b>
<b>Unit-1</b>		
1	Introduction to Sericulture - Origin and history of Sericulture - Silk road, spread of Sericulture to Europe, South Korea, Japan, India and other countries.	4hrs.
2	Sericulture map of India and World. Components of Sericulture.	2hrs.
3	Sericulture organization in India and Karnataka ; role of state departments of Sericulture, CSB, National Sericulture Research Institutes, Universities and NGOs in Sericulture development.	3hrs.
4	Sericultural practices in tropical and temperate climate. Employment generation in sericulture- Role of women in sericulture. Family labour optimization	3hrs.
<b>Unit-2</b>		
5	Sericultural practices in rain-fed and irrigated conditions; traditional and non-Traditional areas.	2hrs.
6	Salient features, economic importance of the family Moraceae. Phytogeography and systematics of the genus <i>Morus</i> L. and its species. Botanical description of mulberry.	4hrs.
7	Morphology of mulberry and Floral biology of mulberry: Structure of male and female flowers, Catkins.	3hrs.
8	Anther and ovule in mulberry; micro- and mega sporogenesis; development of male and female gametophytes; pollination and fertilization.	3hrs.
<b>Unit-3</b>		
9	Anatomy of mulberry internal structure of stem, root, petiole and leaf lamina; secondary growth in root and stem. Structure and organization.	4hrs.
10	General characteristic features of insects; classification of sericigenous insects Characteristic features of the order Lepidoptera; detailed study of the families- Saturniidae and <i>Bombycidae</i> .	2hrs.
11	Classification of silkworms based on moultnism, voltinism and geographical distribution; popular silk worm breeds and hybrids of Karnataka; their Economic traits.	2hrs.
12	Silkworm egg: Morphology and structure ; Parthenogenesis. Gametogenesis- Oogenesis and Spermatogenesis.	4hrs.
<b>Unit-4</b>		
13	Fertilization and Embryonic development in silkworm <i>Bombyx mori</i> .	4hrs.
14	Life cycle of <i>Bombyx mori</i> ; Morphology of egg, larva, pupa and adult.	2hrs.
15	Morphology and anatomy of digestive, circulatory, excretory, respiratory, Nervous system of silkworm larva.	3hrs.
16	Morphology and anatomical structure of Silk gland, reproductive systems of silkmoth.	3hrs.

<b>DSC-1 (SER)A: MULBERRY AND SILKWORM BIOLOGY</b>		
<b>PRACTICAL</b>	<b>12 PRACTICALS OF 3HRS. EACH</b>	
1	Sericulture maps: (a) World maps and Silk Road. (b) Sericulture map of India and Karnataka.	1 Prac.
2	Taxonomic description of mulberry.	1 Prac.
3	Study of five popular mulberry cultivars of Karnataka (Mysore local, K <sub>2</sub> , S <sub>36</sub> , S <sub>13</sub> and V <sub>1</sub> )	1 Prac.
4	Mounting of Pollen grains, Ovule and Embryo.	1 Prac.
5	Anatomy of petiole, leaf lamina, stem and root.	1 Prac.
6	Anatomy of petiole, leaf lamina, stem and root	1 Prac.
7	Lifecycle of <i>Bombyx mori</i> - Morphology of egg, larva, pupa and adult of <i>Bombyx mori</i> .	1 Prac.
8	Embryo mounting: 7 <sup>th</sup> , 8 <sup>th</sup> and 9 <sup>th</sup> day	1 Prac.
9	Sex separation in larva, pupa and adult of the silkworm <i>Bombyx mori</i> .	1 Prac.
10	Dissection and display of: (a) Digestive system of silkworm larva. (b) Silk glands.	1 Prac.
11	(c) Mounting of larval mouth parts and spiracle. (d) Nervous system of silkworm larva.	2 Prac.
12	Dissection and display of: (a) Reproductive system of male and female moths.	2 Prac.
<b>SCHEME OF PRACTICAL EXAMINATION</b>		
<b>Duration-3hrs.</b>		<b>Max. Marks = 40</b>
Q1	Taxonomic description of any one of the popular mulberry varieties. (Mysore local / K <sub>2</sub> / S <sub>36</sub> / S <sub>13</sub> / V <sub>1</sub> )	10marks
	Note: Distribution of marks.	
	a) Identification of the variety-4 b) Diagnostic features -4 c) Sericultural importance -2	
Q2	Sectioning and Mounting of Petiole/ Leaf Lamina/ Stem/ Root/ Pollen grains/ Ovule/ Embryo.  (OR) Mounting of 7 <sup>th</sup> / 8 <sup>th</sup> / 9 <sup>th</sup> day embryo/ larval skin / spiracle / body scales of silk moth/ Mouth parts	10marks
	Note: Distribution of marks	
	a) Staining procedure -3 b) Preparation and display -4 c) Labeled diagram and Identification-3	
Q3	Any one of the following : Dissect and Display. Male and Female reproductive system / Silk glands / Digestive system / Nervous system	10marks
	Note: Distribution of marks	
	a) Dissection and display - 5 b) Labeled diagram with description - 5	
Q4	Identify and comment on the spots A, B, C and D. (Any four from the practical syllabus/ 2.5 for each)	10marks

<b>II SEMESTER</b>		
<b>DSC-(SER)B: MULBERRY CULTIVATION AND SILKWORM REARING</b>		
<b>Theory</b>	<b>4hrs/ week x 16weeks=64hrs.</b>	
<b>Unit-1</b>		
1	Definition of soil, soil structures, soil textures and soil profile. Types of soils in India, soil conservation methods.	4hrs.
2	Importance of soils fertility with reference to mulberry cultivation; soil Analysis- soil sampling, soil pH, organic carbon and NPK level.	3hrs.
3	Propagation of mulberry- seedling, sapling, grafting and layering.	2hrs.
4	Establishment of mulberry garden: Areas under mulberry cultivation in India, Species and Varieties under cultivation in India, General Descriptions, Climatic requirements, Soil conditions, mulberry cultivation under rain-fed and irrigated conditions, mechanization in mulberry cultivation.	3hrs.
<b>Unit-2</b>		
5	Introduction to different types of Manures and fertilizers: Bio fertilizers, Foliar nutrition, Plant nutrients (macro and micro nutrients), composting, vermicomposting.	4hrs.
6	Estimation of leaf yield: Importance of leaf quality. Inter cultivation and Mulching practices: Purpose, methods, time and frequency.	4hrs.
7	Irrigation: Importance, Source, methods, periodicity and quantity of irrigation, over- irrigation and its effects.	2hrs.
8	Leaf harvesting: harvesting methods (leaf and shoot harvests); transportation and preservation of harvested leaf and shoots. Pruning-Objectives, Importance and methods.	2hrs.
<b>Unit-3</b>		
9	Rearing house: Location, orientation, plan and utilities; model rearing house; low-cost rearing house. Rearing appliances- shelf and shoot rearing; requirements of rearing appliances (per unit rearing of 100dfls)	3hrs.
10	Disinfection of rearing house and rearing appliances; disinfectants (formalin, bleaching powder, chlorine dioxide, slaked lime and iodine compounds); Rearing and personal hygiene.	3hrs.
11	Selection of silkworm races/ breeds for rearing-advantages and disadvantages of bivoltine and multivoltine pure races/ breeds and hybrids.	3hrs.
12	Incubation-definition, requirement of environmental conditions, incubation devices; identification of different stages of development; black boxing and its importance.	3hrs.
<b>Unit-4</b>		
13	Chawki rearing: Preparation; brushing and its methods; types of chawki rearing - traditional and improved method; optimum environmental conditions; methods and frequency of feeding; methods of bed cleaning; spacing; moulting And care during moult.	3hrs.
14	Late age silkworm rearing: Methods; optimum environmental conditions; feeding quantity and frequency; methods of bed cleaning; spacing; moulting And care during moult.	3hrs.
15	Identification of spinning larva; spinning; mounting and mounting density; types of mountages, their advantages and disadvantages; environmental Requirements during spinning.	3hrs.
16	Harvesting: Time of harvesting; sorting, storage/ preservation, packaging and Transport of cocoons; leaf- cocoon ratio; maintenance of rearing records.	3hrs.

**DSC-B(SER)B: MULBERRY CULTIVATION AND SILKWORM REARING****PRACTICAL****12 PRACTICALS OF 3 HRS. EACH**

1	Determination of soil pH and water holding capacity in different soil Samples.	1 Prac.
2	Mulberry Farm implements.	1 Prac.
3	Preparation of land, pits and rows; preparation of rooting media (fieldwork).	1 Prac.
4	Raising of sapling and seedling (fieldwork).	1 Prac.
5	Inter cultivation, mulching, irrigation, pruning and estimation of leaf yield. (Demonstration and exercise).	1 Prac.
6	Grafting and Layering in mulberry.	1 Prac.
7	Harvesting and preservation techniques; leaf selection for different instars.	1 Prac.
8	Rearing houses-model rearing house and low-cost rearing house. Rearing appliances and their uses	2 Prac.
9	Disinfection-Types of disinfectants-concentration and dosage requirement; Preparation of spray formulation of disinfectants.	1 Prac.
10	Incubation of silkworm eggs-Methods; black boxing.	1 Prac.
11	Brushing: Methods; Calculation of Hatching percentage. Chawki Rearing; paraffin paper and blue polythene sheet. Bed cleaning: bed cleaning net.	1 Prac.
12	Moulting: Identification of moulting larva, care during moulting. Late Age Silkworm Rearing: Methods. Mounting and mounting density; harvesting of cocoons; assessment of cocoons; types of mountages; Maintenance of records for silkworm rearing.	2 Prac.

**SCHEME OF PRACTICAL EXAMINATION****Duration-3hrs.****Max. Marks=40**

Q1	Determination of soil pH / water holding capacity/grafting/ layering	10marks
	Note: Distribution of marks	
	a) Procedure -3	
	b) Labeled Diagram -2	
	c) To conduct Experiment -5	
Q2	Calculations and procedure about disinfection/ brushing/ bed cleaning/ Hatching percentage.	10marks
	Note: Distribution of marks	
	a) Procedure/ Description -5	
	b) To conduct Experiment/ calculation -5	
Q3	Identify and comment on the spots A, B, C and D. (Any four from the practical syllabus/ 2.5 marks for each)	10marks
Q4	Submission of fieldwork/field visit/ rearing report and Viva-voce (Any five questions from the practical syllabus)	10marks

-----

### COMPONENTS OF INTERNAL ASSESSMENT

Sl no	THEORY PAPER		Marks Allotted
<b>1</b>	C-1	Submission of one Assignment by student	10 marks
	C-2	Conduct of Internal Class Test	10marks
<b>PRACTICAL</b>			
<b>2</b>	C-1	Student Attendance	5 marks
	C-2	Evaluation of students class record	5 marks

### THEORY QUESTION PAPER PATTERN FOR C-3 EXAMINATION

Sl. No	Type of question	Marks per Question	No. of Questions	Answerable Questions	Total
1	Define/Mention/Expand the following	2	06	05	<b>10</b>
2	Write short notes on the following	4	06	05	<b>20</b>
3	Give brief answers on the following	6	05	03	<b>18</b>
4	Write in detail/explain the following	8	06	04	<b>32</b>
<b>Total =</b>					<b>80</b>

SIGNATURE OF THE MEMBERS OF BOARD OF STUDIES UG FOR APPROVAL

**PROF. FATHIMA SADATULLA**                      -Sd-

**PROF. L.H. SHIVASHANKARAPPA**                      -Sd-

**PROF. RAMAKRISHNA NAIKA**                      -Sd-

**PROF. A.C.MANJULA -**                      -Sd-

-Sd-  
**PROF.T.S. JAGADEESH KUMAR**  
**CHAIRMAN BOS /UG/ BCU**