



A PROPOSAL TO START

**Post Graduate Diploma In Sericulture
(PGDS)**

Under Faculty of Science & Technology

AT

DEPARTMENT OF ZOOLOGY,
SHIVAJI UNIVERSITY,
KOLHAPUR – 416 004

2017

Standard Format For Syllabus Framework

- A. Ordinance and Regulations:- (as applicable to degree / programme)
B. Shivaji University, Kolhapur, New Syllabus for Post Graduate Diploma in Sericulture(PGDS)

1. **Title: Post Graduate Diploma in Sericulture(PGDS)**

2. **Faculty** of Science & Technology

3. **Year of Implementation:** 2017

4. **Preamble:**

The sericulture industry stands for livelihood opportunity for millions owing to high employment oriented, low capital intensive and remunerative nature of its production. The very nature of this industry with its rural based on-farm and off-farm activities and enormous employment generation potential has attracted the attention of the planners and policy makers to recognize the industry among one of the most appropriate avenues for socio-economic development of a largely agrarian economy like India. India has the unique distinction of being the only country producing all the five known commercial silks, namely, mulberry, tropical tasar, oak tasar, eri and muga, of which muga with its golden yellow glitter is unique and prerogative of India

Growth and development of an industry or success of a project depends on the quality of manpower attached to it, their skill levels and their ability to learn and adapt to new technologies & skills-sets. Income generation is also believed to be directly related and proportional to the degree of development of desired skills and traits. Central Silk Board had realized the importance of training and capacity building fairly early and hence, in addition to being a R&D focused organization it has developed a strong training orientation.

In this ever increasing era of agro based silk and sericulture industries consultancy/trained manpower are becoming a part of process and therefore, there is need of qualified and trained/experienced manpower for providing field solutions. Nowadays, there is high demand for such silk /sericulture professionals from different sectors. In many nations, it has been made mandatory to appoint well trained and qualified professional for the silk Industry.

Every year around 200 students of Department of Zoology, Botany, Biochemistry, Biotechnology complete M. Sc. degree and join for Consultancy or Industry as a Professional. With their M. Sc. , if they get add-on course as a Diploma in Sericulture or PG Diploma in Sericulture , which is compulsory/ desirable under recruitments of state and central sectors, particularly for the jobs of Central Silk Board an autonomous body of Govt., of India , Directorate of Sericulture Govt., of Maharashtra

and in various NGO as BAIF etc., these students will get immediate entry in the industry and good salary package after completion of their P.G.

Considering the present scenario in mind, Dept of Zoology, propose to start P.G. Diploma in Sericulture, (PGDS). This course is being introduced as an add on course for M.Sc. students and Job oriented course for unemployed graduates. As this course covers all aspects of Sericulture, after successful completion of this course, a candidate can start his own Sericulture farm, i.e. growing mulberry plantation, rearing of silkworms, Preparation of silkworm seed, Reeling of cocoons etc. Presently, a sericulturist, who practices Sericulture with one acre mulberry plantation and by rising silk cocoons is getting an income of Rs.3,00,000/- per year with a net profit of Rs.1,80,000/-. With this huge potential, this course would be able to deliver trained workforce, who will be able to motivate other youth in rural areas to take up this avocation. Ultimately, this will bring sustainable economy to our villages. With the changing climatic scenario, in the event of onset of draught conditions, mulberry plant can tolerate and able to yield the leaves required for Silkworm rearing. Moreover, the climate of Western Maharashtra is very congenial for Silkworm rearing. Mulberry leaf is having medicinal values and there are so many by-products that can be reaped from cocoons made by silkworms. The course is designed for the students and employees from Sericulture govt. depts. who will be exposed to comprehensive and rigorous training covering all aspects of Sericulture Science.

5.General Objectives of the Course:

To develop highly qualified professional manpower in Silk and Sericulture sector. In Sericulture the basic requirement lies on systematic quality based coaching and training in advanced Science and Technologies/innovations. Therefore, the course is designed to train and provide expert human resource to Silk industry and expected to bring direct benefits to Rural development and sericulture farming community.

The course is based on following objectives:

- ❖ To increase the employability of students
- ❖ To inculcate the entrepreneurship and capacity building among the students
- ❖ To train the people from poor economic background so as to take Sericulture as a prosperous avocation
- ❖ To ensure sustainable rural economy by adopting Sericulture from any kind of climatic vagaries

- ❖ To develop an expert manpower to handle the Sericulture units/ Corporate sector.
- ❖ To give knowledge about Mulberry cultivation , silkworm Rearing techniques to the students.
- ❖ To make the student aware about Soil to Silk concept, Sericulture extension and innovative technologies/ techniques etc.
- ❖ To train the students in Silk production techniques .

6. Duration of Course:

The duration of the course is 1 year and the lectures will be delivered thrice a week, two hours from 5 pm to 7 pm. These timings will be suitable for students and working employees from government and industry.

7. Course pattern:

Candidates will be required to undergo learning in theory, project development and workshop subjects during the academic year. Candidates also will be exposed to industrial exposure through Industrial visits to get familiar mulberry cultivation, silkworm rearing, Raw silk production, Silkworm egg production, weaving and cocoon production.

8. Fee Structure :

| Particulars | Rupees Annual fee |
|---------------------------------|----------------------------|
| Tuition fee | 9000 = 00 |
| Laboratory fee | 1000 = 00 |
| Annual fee : per student | Total : 10,000 = 00 |

Other fee will be applicable as per university rules/ norms

9. Eligibility for Admission :

1. The students with graduation from all faculties will be eligible.
2. This course is an add on course for M.Sc students from Shivaji University campus/departments.
3. Students are not required to submit MC/TC.
4. In case applicant number is more, the entrance test will be conducted.

10. Medium of Instruction: English

11. Course structure: Course will be of one year duration.

| Sr. No | Code | Paper Title | Theory Hours | Practical Hours | Marks | | Total |
|--------|--------|-----------------------------|--------------|-----------------|----------|----------|-------|
| | | | | | External | Internal | |
| 1 | PGDS-1 | Food plants cultivation and | 40 | -- | 100 | -- | 100 |

| | | | | | | | |
|--------------------|--------|---|----|---------|-----|-----|------------|
| | | management | | | | | |
| 2 | PGDS-2 | Silkworm rearing and management | 40 | -- | 100 | -- | 100 |
| 3 | PGDS-3 | Grainage/Reeling/ economics & value addition in sericulture | 40 | -- | 100 | -- | 100 |
| 4 | PGDS-4 | Silkworm , host plant pest & disease management | 40 | -- | 100 | -- | 100 |
| 5. | PGDS-5 | Intensive practical Training and Visits to Units | -- | 3/Weeks | -- | 100 | 100 |
| 6. | PGDS-6 | Project | -- | 1/Year | 50 | 50 | 100 |
| Total marks | | | | | | | 600 |

12. Scheme of Teaching and Examination :

Classes will be conducted on Friday and Saturday without hampering regular courses of the department. Practicals will be conducted on Sunday and as per requirement. The students will be undergoing continuous assessment throughout the academic year through seminars, tests, tutorials etc. The evaluation will consist of internal assessment, external assessment and viva voce for the project.

13. Standard of passing:

for Theory and Practical 40%. Passing will be as per university rules.

14. Nature of Question Paper and Scheme of Marking:

PGDS (Post Graduate Diploma in Sericulture)

Examination

Paper-

Sub. Code: _____

Day and Date:

Total Marks: 100

Time:

Instructions:

- 1) All questions are compulsory
- 2) Draw neat and labelled diagrams wherever necessary

Question 1. Write short notes on (any two) 20

- a)
- b)
- c)

Question 2. Write brief note on(any four). 20

- a)
- b)

- c)
d)
e)
f)
- Question 3. Solve any two. 20
- a)
b)
c)
- Question 4. Describe in detail (any one) 20
- a)
b)
- Question 5. Write Essay on (any one) 20
- a)
b)

15. Equivalence in Accordance with Titles and contents of papers:

(For Revised syllabus): NA

16. Special Instructions, if any: Nil

17. Detailed Title of Papers and Units and No. of Lectures

Paper-I: FOOD PLANTS CULTIVATION AND MANAGEMENT

Unit- I: History and scope of Sericulture. (10)

General account of global production of mulberry and non-mulberry silk, silk route, Geographical distribution of mulberry and non-mulberry sericulture, scope of sericulture in India.

Unit- II: Types of silkworms (5)

Life history of mulberry silkworm, growth stages of mulberry silkworm, classification of silkworm, non-mulberry silkworm's insects

Unit- III: soil management and cultivation of mulberry (10)

Agro climatic zones and agro climatic conditions for mulberry cultivation, Site suitability for mulberry garden establishment, Soil Management, Classification of different types of soil, Physical and chemical properties of soils, Selection and preparation of land for mulberry cultivation

Unit- IV: Mori culture (15)

Characteristic features of popular mulberry varieties of tropical and temperate regions

Mulberry propagation- Scope and significance of sexual and asexual propagation, Different methods of propagation

Mulberry crop production- Planning for establishment of mulberry garden, Concept and establishment of mulberry garden for chawki & late age worms,

Water management- Concept of irrigation, Methods of irrigation, Frequency of irrigation

Paper-II: SILKWORM REARING TECHNOLOGY & MANAGEMENT

Unit I: Pre-requisites for rearing (10)

Selection of silkworm breeds for rearing, estimation of mulberry leaf yield and assessment of leaf quality, estimation of brushing capacity requirements of rearing, disinfecting silkworm rearing house and appliances, silkworm rearing house, characteristics of rearing house, selection of site, provision for various activities in rearing

Unit II: Egg handling, Incubation & Chawki rearing (10)

Pre-incubation care of silkworm eggs, incubation, black boxing, hatching, brushing of larvae, chawki rearing ,characteristics of chawki worms and their rearing, leaf quality for chawki rearing, chawki rearing practices, commercial chawki rearing, transportation of chawki worms, economics of chawki rearing

Unit-III: Late age silkworm rearing (10)

Characteristics of late age silkworms, rearing methods, tray rearing, shelf rearing, floor rearing, advantages and disadvantages of shoot feeding and floor rearing, environmental conditions for silkworm rearing, leaf harvest, transportation and preservation, leaf quality and quantity, late age rearing, mechanization in silkworm rearing

Unit IV: Non- mulberry silkworm rearing (10)

Tasar Silkworm Rearing, Oak Tasar Silkworm Rearing, Eri Silkworm Rearing, Muga Silkworm Rearing

Paper III: GRAINAGE / REELING / ECONOMICS & VALUE ADDITION IN SERICULTURE

Unit –I: Silkworm seed technology (10)

Silkworm egg production, embryonic development, diapause and non-diapause eggs, acid treatment, incubation of eggs in grainages through incubation chambers and related aspects

Unit –II: Silk Technology (10)

Textile fibers: brief introduction to natural and synthetic fibers silk industry: general silk industry in various states of India cocoons: assessment of cocoon properties, silk reeling, cocoon stifling storage & preservation of cocoons in silk reeling units, cocoon cooking, silk reeling and re-reeling, raw silk testing, spun silk yarn, silk weaving.

Unit –III: Sericulture organization and economics (10)

Marketing of cocoon and silk, organizational set up of sericulture, economics of mulberry cultivation economics of cocoon production economics of seed cocoon, economics of silk production, extension education, classification of various extension teaching methods

Unit IV: Harvesting and marketing of cocoons (10)

Time of harvest, methods of harvest, deflossing, sorting of cocoons, assessment of cocoons, transportation and marketing of cocoons economics of different scales of rearing and cost benefit ratio ,meaning of cost, classification of costs, relationship of fixed and variable costs to greater profit or smaller loss on one hectare mulberry farm, break-even analysis, cost of cocoon production, economies of scale.

Paper IV: SILKWORM, HOST PLANT PEST & DISEASE MANAGEMENT

Unit I: Mulberry and Non-Mulberry food plants diseases and their management(15)

Types of mulberry diseases, foliar diseases of mulberry and their management, leaf spot disease, powdery mildew disease, leaf rust disease, leaf blight disease, preparation of the spray solution, fungicides and their toxicity, equipments used for spraying the fungicides,precautions to be taken while spraying the fungicides, soil-borne diseases of mulberry,nursery diseases, root knot disease, root rot disease, , types of diseases of non-mulberry silkworm host plants, diseases of tropical tasar silkworm host plants, diseases of oak tasar silkworm host plants,diseases of muga silkworm host plants,diseases of eri silkworm host plants,tips on fungicides. integrated disease management (IDM).

Unit II: Mulberry and Non-Mulberry host plant pests and their management (10)

Types of mulberry pests, sap suckers leaf eaters, root / shoot feeders, factors responsible for mulberry pest outbreak pesticide calculation .pests of non-mulberry silkworm host plants, pests of tasar silkworm host plants, pests of oak tasar silkworm host plants, pests of muga silkworm host plants, pests of eri silkworm host plants, management of pests.

Unit -III: Mulberry and Non-Mulberry Silkworm diseases and their management (10)

Common diseases of silkworm, grasserie disease, flacherie disease, muscardine disease, pebrine disease, ,diseases of non-mulberry silkworms, diseases of tasar and oak tasar silkworms, diseases of muga silkworms, diseases of eri silkworms, disease management

Unit IV: Mulberry and Non-Mulberry Silkworm pests and their management (5)

Identification of pest, life cycle of uzi fly, uzi fly management and economics, dermestes beetle, pests of non-mulberry silkworms, pests of tasar silkworms, pests of oak tasar silkworms, pests of muga silkworms, pests of eri silkworms

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21. Tips for successful silkworm cocoon crops, Technical Publication, Central Sericultural Research & Training Institute, Mysore.
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Practical s Post graduate Diploma in Sericulture

| Experiment no. | Title of Experiment |
|-----------------|---|
| Experiment no.1 | Estimation of Hatching and Brushing Percentage of silkworm Eggs |
| Experiment no.2 | Estimation of Moisture Content of Mulberry Leaves for chawki Rearing |
| Experiment no.3 | Determination of mulberry Leaf Driage in the Rearing Bed |
| Experiment no.4 | Estimation of silkworm Larval Density in the Rearing Bed and Silkworm Population During Chawki Rearing |
| Experiment no.5 | Estimation of Larval Density and shoot Quantity Required for Late Age Rearing (Shoot Feeding Method) for 100 dfls |

| | |
|------------------|---|
| Experiment no.6 | Estimation of Uzi Fly Infestation During Late Age silkworm Rearing |
| Experiment no.7 | Evaluation of Different Types of Mountages and its Effects on Defective cocoons |
| Experiment no.8 | Estimation of Cocoon shell Ratio |
| Experiment no.9 | Estimation of Defective Cocoon Percentage from the Given Sample of Cocoon |
| Experiment no.10 | Identification of Different Silkworm Diseases and Method of their Disposal |
| Experiment no.11 | Preparation of Different Disinfectant Solutions Recommended in Sericulture |
| Experiment no.13 | Identification of Major Silkworm Pests |
| Experiment no.14 | Demonstration of Management Practices Against Silkworm pests |

Any other practical as suggested by concerned Teacher

18.Recommended Reading Material: Details are given along with Syllabus

C) Other Features:

- 1. Intake Capacity / Number of Students:** Maximum 40 students in which priority will be given to the university students (60%) and others (40%).
- 2. Library and Laboratory equipment:** This department is running M.Sc. course with Sericulture as one of the specialization. Basic equipment required for conducting practical is existing in the Department. Books on Sericulture are available with University & Departmental libraries. Space Required. The course includes theory papers and intensive Practical training. The theory part can be taught in the Department of Zoology, Shivaji University, Kolhapur. The remaining part of training can be completed in the Laboratory as well as at beneficiaries field in villages/ Technical service centers of sericulture department. The students have to complete project in the industry/Field units and therefore, laboratory space is not required for the one year project. The department has well equipped teaching classrooms and Laboratories for the practical.

D) General Guidelines:Nil