ANDHRA PRADESH STATE COUNCIL OF HIGHER EDUCATION

(A Statutory body of the Government of Andhra Pradesh)

(23)

PROGRAMME: FOUR-YEAR B.Sc.(Hons)

(With Zoology, Sericulture and Chemistry Disciplines)

DOMAIN SUBJECT

SERICULTURE

(With Learning Outcomes, Unit-wise Syllabus, References, Co-curricular Activities & Model Q.P

Skill Enhancement Courses (SECs) for Semester V, from 2022-23

(To Be Implemented From 2020-21 Academic Year)

SUBJECT EXPERT

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STSN GOVT. DEGREE COLLEGE Dt. 16-04-2022 SRI SATYA SAI DT. Pin-515 591 KADIRI

PRINCIPAL
STSN GOVERNMENT DEGREE COLLEGE
KADIRI-515 591

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Chairman

Board Of Studies For Sericulture

U.G.Examinations

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A.P. INDIA.

Approved

PRINCIPAL
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ANDHRAPRADESH STATE COUNCIL OF HIGHER EDUCATION

(A Statutory body of the Government of Andhra Pradesh)

REVISED UG SYLLABUS UNDER CBCS

(Implemented from Academic Year - 2020-21)

PROGRAMME: FOUR YEAR B.SC. (Hons)

Domain Subject: **SERICULTURE**

Skill Enhancement Courses (SECs) for Semester V, from 2022-23

(Syllabus with Learning Outcomes, References, Co-curricular Activities & Model Q.P. Pattern)

Structure of SECs for Semester–V

(To choose one pair from the four alternate pairs of SECs)

Univ Code	Course Number 6&7	Name of Course	Hours/Week Theory +Practical	Credits Theory+ Practical	Marks	
					IA–20 FW- 05	Sem End T+P
	6A	SUSTAINABLE MULBERRY AGRONOMICAL PRINCIPLES AND PRACTICES	3+3	3+2	25	75+50
	7A	SILKWORM REARING AND COCOON PRODUCTION TECHNOLOGY	3+3	3+2	25	75+50
		OR				
	6B	POST HARVEST COCOON PROCESSING TECHNOLOGY	3+3	3+2	25	75+50
	7B	SILKWORM SEED TECHNOOGY	3+3	3+2	25	75+50
		OR				
	6C	ECOFRIENDLY NATURE FARMING	3+3	3+2	25	75+50
	7C	VALUE ADDED PRODUCTS IN SERICULTURE	3+3	3+2	25	75+50
		OR				
	6D	SERI BUSINESS-AN EMERGING ENTREPRENEURESHIP	3+3	3+2	25	75+50
	7D	SERI BIOTECHNOLOGY	3+3	3+2	25	75+50

*** To be taught by Sericulture/Life Sciences Teachers

Note: For Semester–V, for the domain subject Sericulture, any one of the four pairs of SECs shall be chosen as courses 6 and 7, i.e., 6A & 7A or 6B & 7B or 6C & 7C or 6D & 7D. The pair shall not be broken (ABCD allotment is random, not on any priority basis).

Note-2: One of the main objectives of Skill Enhancement Courses (SEC) is to inculcate skills relatedto the domain subject in students. The syllabus of SEC will be partially skill oriented. Hence, teachers shall also impart practical training to students on the skills embedded in syllabus citing related real field situations.

A.P. State Council of Higher Education

Semester-wise Revised Syllabus under CBCS, 2020-21

Course Code:

Four – year B.Sc. (Hons) Domain Subject: SERICULTURE
IV Year B. Sc.(Hons)–Semester –V

Max. Marks: 100+50

Course 6A: SUSTAINABLE MULBERRY AGRONOMICAL PRINCIPLES AND PRACTICES
(Skill Enhancement Course (Elective), -Credits: 05)

I. Learning Outcomes:

Students at the successful completion of this course will be able to learn and gain practical knowledge

- The influence of various factors in leaf quality and productivity.
- Acquaint with the know-how of mulberry garden establishment under different agro-climatic conditions.
- The various new technologies of mulberry production

II. Syllabus: (*Total Hours: 90 including Teaching, Lab, Field Skills Training, Unit tests etc.)*

Unit-I –Soils Fertility and Soil reclamation

Edaphic factors: Soils of mulberry gardens, types soil, profile structure, topography, Porosity, aeration, soil water, organic matter and soil micro-organisms. Soil reaction: salinity, acidity and alkalinity, soil amendments. Climatic factors: Role of light, temperature, wind velocity, altitude, rainfall, relative humidity on growth and development of mulberry.

Unit-II- Integrated Nutrient Management

Mulching: Mulches and their significance in soil conservation. Manuring: Organic manures and their application: (FYM, compost, tank silt, night soil, sewage sludge, oil cakes, vermicompost). Method of compost and Vermicompost preparation. Organic Manuring in mulberry cultivation and organic farming.Green manuring: green manure crops and their relevance in soil productivity. Biofertilizer: Types (Nitrogen, phosphate, cellulosytic), importance, application and limitation. Mineral nutrition: Functions of essential macro and micronutrients. Nutritional deficiency in crop plants-causes. Nutrition disorders-diagnostic symptoms-Correcting nutrient deficiency. Mineral toxicity, Chemical fertilizers: Types (straight, compound, complex and complete fertilizers). Chemical composition of different fertilizers. Application methods, dosage, calculation, fertilizer schedules. Merits and demerits.

Unit -III –Mulberry Agronomic principles, practices and meteorology

Land Preparation, Mechanization in mulberry cultivation, Selection of elite varieties for irrigated and rain fed conditions with their characteristic features and yield potentialities, Planting material (cuttings, saplings, grafts, layers) and their practical utility, Spacing systems and their importance in leaf productivity under different field conditions. Planting systems: Pit system, row system, paired row system, & Kolar system, Inter- cultivation: objectives, methods, and periodicity, Weeding: common weeds of mulberry plantations. Problems posed by weeds. Preventive and control methods. Physical, chemical, biological, and integrated weed control measures.

Unit -IV–Mulberry Agronomic principles, practices and meteorology

Irrigation and drainages: Water requirement of mulberry, water resources, water quality, irrigation systems (surface, subsoil, sprinklers, and drip system) and practical utility in mulberry management. Scheduling of irrigation for mulberry.Pruning: Types, Objectives, methods and practical relevance.
Harvesting: Leaf, branch and shoot harvesting methods in relation to cultivation and rearing practices. Storage, transportation and preservation methods.

Unit -V Mulberry Diseases and Integrated Pest Management(IPM)

Identification of Mulberry Foliar Diseases. Stem Diseases and Root diseases. Mulberry pests.

III.References

1. Bongale, U.D (1995) Fertilizers in mulberry cultivation. Pushpa Sree Publications, Thalaghattapura, Bangalore.
2. Dokuhon, Z.S (1998). Illustrated Textbook on Sericulture. Oxford & IBH publishing Co, Pvt. Ltd, New Delhi, Calcutta.
3. Guptta, R.K & Mittal, R.K (1983) Bibliography of Indian Weeds. Associated Pub. Co. New Dehli.
4. asao Aruga (1994) Principles of Sericulture (Translated from Japanese) Oxford & IBH publishing Co, Pvt. Ltd, New Delhi.
5. Hortmann and Kesler (1993) Plant Propagation, principles and practices. Prentice Hall, Hemel Nemstead.
6. krishnamurthy, N. (1981) Plant growth substances including application in Agriculture. Tata McGraw Hill Pub. Co. Ltd. New Delhi.
7. Shankar, M.A (1998) Handbook on mulberry Nutrition, Multiplex, Bangalore.
8. Subba Rao, N.S (1998) Biofertilisers in Agriculture. Oxford & IBH Pub. Co, Pvt. Ltd, New Delhi.
9. A text Book on Mulberry Crop Protection. Govindaiah, V.P Gupta, D.D Sharma, S. Rajadurai and V. Nishitha Naik, Published by Central Silk Board, Bangalore-68, India. 2005.
10. Rajanna L, Das P.K, Ravindra S, Bhogesha K, Mishra R.K, Singhvi N.R, Katigar R.S and Jayaram H. Mulberry Cultivation and Physiology Central Silk Board, Bangalore, Dec.2005.

Web resources:

1. http://www.fao.org/3/ad108e/ad108e0a.htm
2. https://onlinecourses.swayam2.ac.in/cec19_bt05/preview
3. https://www.skuastkashmir.ac.in/DisplaySInformation.aspx?id=16&pid=20592
4. http://www.fao.org/3/x9895E/x9895e04.htm
5. https://www.notesonzoology.com/sericulture/moriculture/common-indian-mulberry-plants-and- their-morphological-characteristics/347

Web resources suggested by the teacher concerned and the college librarian including reading material

Course6 A: SUSTAINABLE MULBERRY AGRONOMICAL PRINCIPLES AND PRACTICES PRACTICAL SYLLABUS

IV. Learning Outcomes:

On successful completion of this practical course, student shall be able to:

Identify the characters of Fresh water cultivable species

Learn Organic Farming and Eco friendly Self employable Practices.

Examine the diseases of Mulberry

Suggest measures to prevent diseases in Moriculture

V. Practical (Laboratory) Syllabus: (30hrs) (Max.50Marks)

a. Soil Sampling
b. Raising Nursery
c. Planting systems
d. Preparation of Cuttings
e. Composting and Vermi composting through Recycling of Seri cultural farm Residues

VI. Lab References :

1. Rajanna L,Das P.K, Ravindra S, Bhogesha K , Mishra R.K,Singhvi N.R, Katigar R.S andJayaram H. Mulberry Cultivation and Physiology Central Silk Board, Bangalore,Dec.2005

Web sources suggested by the teacher concerned and the college librarian including reading material

VII. Co-Curricular Activities:

a) **Mandatory**: *(Student training by teacher in field skills: total15hrs, Lab: 10+ filed 05):*

1. For Teacher: Training of students by the teacher in the laboratory and field for notlessthan15hourson

the skills of preparation of Sericulture Map of India – identification of Mulberry plants – plantation- observation of Silk worm reproductive biology- observation of silk glands

2. **For Student:** Students shall (individually) visit any local Mulberry Plantation area and Silk worm Rearing center – make observations on plants, procedures and yield. Observations and outcomes shall be submitted as Fieldwork/Project work Report not exceeding 10 pages to teacher in the given format.
3. Max marks for Fieldwork/Project work Report: 05.
4. Suggested Format for Fieldwork/Project work: *Title page, student details, index page, details of place visited, observations made, findings and acknowledgements.*
5. (IE)Unit tests.

6. **b) Suggested Co-Curricular Activities**

1. Web based **:** Collection of additional information of mulberry plants
2. Charts /Models preparation of silkworm developmental stages

7. Seminar, Invited lecture, .Assignment, Group discussion. Quiz, Collection of Material, Video preparation etc.

A.P. State Council of Higher Education
Semester-wise Revised Syllabus under CBCS, 2020-21

Course Code:

Four – year B.Sc. (Hons) Domain Subject: **SERICULTURE**
IV Year B. Sc.(Hons)–Semester –V

Max. Marks: 100+50

Course 7 A: SILKWORM REARING AND COCOON PRODUCTION TECHNOLOGY
(Skill Enhancement Course (Elective), -Credits: 05)

I. Learning Outcomes:

Students at the successful completion of this course will be able to learn and gain practical knowledge in

- The influence of various factors on silkworm growth and development.
- The new techniques silkworm rearing.
- Identification of Disease Incidence
- Acquire scientific techniques of disinfectant preparations
- Self employable opportunities

Unit -I -Disinfection methods and Disinfectants

Silkworm rearing technology: Prequisites for rearing. Rearing house, model rearing house, construction of different types of rearing houses, modification to control Uzi fly infestation, sanitation, disinfectants and their effects, and their role in disease management, importance of disinfection-physical, chemical, and gaseous types-formalin requirements for effective disinfection. Rearing equipments for shelf rearing and shoot rearing methods.

Unit -II Young age silkworm rearing Technology

Methods and importance of incubation, black boxing techniques, brushing of silkworm, Characteristics of young age larvae (chawki), and different methods adopted including isolation chamber method, co-operative chawki rearing, and importance ofchawki rearing centers.

Unit –III-Late age Silkworm Rearing Technology

Late age silkworm rearing: Characteristics-different methods (shoot and tray rearing), their merits, and demerits-importance in sericulture economics. Cleaning and Spacing: Objectives and methods of cleaning. Time and frequency of cleaning for different instars, objectives of spacing, optimum spacing for different ages, molting, care during molting. Recent/Modern concepts in chawki and late age silkworm rearing (Isolation chamber, single feeding shoot, pit, and floor rearing), merits and demerits. Improved techniques of rearing over traditional practices. Spinning: Characteristics of spinning larvae, mechanism of silk formation, cocoon formation Mounting-different methods-merits and limitations, care during mounting, environmental conditions during spinning. Harvesting of Cocoons: Time of harvesting of Cocoons. Defective cocoons-double, and flimsy. Deformed, stained and melted cocoons-characteristics and their impact on cocoon quality, remedial measures to avoid defective cocoons, cocoon assessment-transportation and marketing of cocoons-leaf cocoon ratio.

Unit.IV: Basic Concepts of Silkworm Diseases

Classificationof SilkwormDiseases. Etiology of Silkworm Diseases. Spread of Silkworm Diseases. Disease Producing Characteristics of Pathogenic Microbes. Defence Mechanisms of the Host

Unit. V: Varieties of Silkworm Diseases and Integrated Pest Management

Bacterial diseases. Viral Diseases. Fungal diseases. Protozoan Diseases. Exorista(UZI) and Pediculoides

III.REFERENCES

1. Charsley, S.R. (1982). Culture and Sericulture. Academic Press Inc., New York, U.S.A
2. Chowdhury, S.N. (1998) Muga Culture. Central Silk Board, Bangalore, India
3. Dokuhon, Z.S. (1998). Illustrated Textbook on Sericulture. Oxford & IBH publishing Co., Pvt. Ltd. Calcutta.
4. Hamamura, Y. (2001). Silkworm rearing on Artificial Diet. Oxford & IBH publishing Co., Pvt. Ltd. New Delhi.
5. Hasao Aruga (1994). Principles of Sericulture (Translated from Japanese) Oxford & IBH publishing Co., Pvt. Ltd. New Delhi.
6. Jolly, M.S. Chowdhuty, S.N and Sen. (1975). Non-Mulberry Sericulture in India. Central Silk Board, Bombay, India.

7. Jolly, M.S (1998). Tasar Culture. Central Silk Board, Bangalore, India.

8. Techniques of Silkworm rearing in the tropics. Economic and Social commission of Asia and the Pacific. United Nations, New York. 1993.

9. Veda, K. Nagai, I., Horikomi, M (1997) Silkworm Rearing (Translated from Japanese. Oxford & IBH publishing co., Co., Pvt. Ltd. New Delhi.

10. Wu Pang-Chuan and Chen Da-Chuang. (1994) Silkworm rearing. Oxford & IBH publishing Co., Pvt. Ltd. New Delhi.

11. Proceedings of the 20th Congress of the International Sericulture Commission-2005. Volume-2. Published by Central Silk Board, Bangalore-68, India.

12. Rajan, R.K. Hemanth Raju 2005, Text Book on silkworm rearing, Central Silk Board, Bangalore.

Web Resources:

1. http://www.fao.org/3/ad108e/ad108e0a.htm
2. https://onlinecourses.swayam2.ac.in/cec19_bt05/preview
3. https://www.skuastkashmir.ac.in/DisplaySInformation.aspx?id=16&pid=20592

Course 7 A: SILKWORM REARING AND COCOON PRODUCTION TECHNOLOGY PRACTICAL SYLLABUS

I. Learning Outcomes:

On successful completion of this practical course, student shall be able to

: Appreciate the morphology of silkworm

Realize the importance of and initiate measures to disinfect the importance of disinfection ofrearing houses and rearing appliances

Differentiate the methods of incubation of silkworm eggs

Prioritize the records in silkworm rearing

II. Practical(Laboratory) Syllabus:(30hrs)(Max.50Marks)

1. Estimation of Hatching and brushing Percentage of Silkworm Eggs
2. Estimation of ERR
3. Identification of Silkworm Disease Incidences
4. Estimation of UZIFly infestation during Late age Silkworm rearing

III. Lab References

1. HasaoAruga (1994). Principles of Sericulture (Translated from Japanese) Oxford & IBHpublishing Co., Pvt. Ltd. New Delhi.

Web resources suggested by the teacher concerned and the college librarian including reading material

IV. Co-Curricular Activities

a) Mandatory: *(Lab/field training of students by teacher (lab10+filed5))*

1. For Teacher: Training of students by the teacher in laboratory and field for notlessthan15hourson the skills/techniques of Rearing of Silk moth
2. For Student: Students shall (individually) visit to Silk worm rearing center and observe all the procedures. He/she shall prepare a Fieldwork/Project work Report on the observations made in the given format not exceeding 10 pages and submit to teacher.

3. Max marks for Fieldwork/Project work Report: 05.
4. Suggested Format for Fieldwork/Project work Report: *Title page, student details, index page, details of place visited, observations made, findings and acknowledgements.*
5. (IE). Unit tests.

b) Suggested Co-Curricular Activities

1. Model Chart preparation of chawki rearing
2. Cocoon collection and observation of characteristics
3. Mountage images / charts preparation
4. Seminar, Invited Lecture, Assignment, Seminar, Group discussion. Quiz, Seminar, Quiz, Collection of Material, Video preparation etc.

A.P. State Council of Higher Education
Semester-wise Revised Syllabus under CBCS, 2020-21

Course Code:

Four – year B.Sc. (Hons) Domain Subject: SERICULTURE
IV Year B. Sc.(Hons)–Semester –V

Max Marks: 100+50

Course 6B: POST HARVEST COCOON PROCESSING TECHNOLOGY
(Skill Enhancement Course (Elective), - Credits: 05)

I. Learning Outcomes:

Students at the successful completion of this course will be able
to To familiarize with the properties of the cocoons.
To acquaint with the technologies adopted in reeling.
To acquaint with the importance of raw silk quality.

II. Syllabus: *Total Hours: 90 including Teaching, Lab, Field Skills Training, Unit tests etc.)*

I.Learning Outcomes:

Students at the successful completion of this course will be able

To familiarize with the properties of the cocoons.
To acquaint with the technologies adopted in reeling.
To acquaint with the importance of raw silk quality.

I. **Syllabus**: (*Total Hours: 90 including Teaching, Lab, Field Skills Training, Unit tests etc.)*

Unit: 1.SILK INDUSTRY

Activities of silk industry in India, China, Japan and S. Korea.Silk production, export and import of silk and silk products. Cocoons, Cocoon classification,Cocoon characteristics-Mulberry, eri, tasar and muga. -colour, shape, size, compactness, grains, weight, shell ratio, filament length, denier, reliability, raw silk percentage, neatness,Factors influencing cocoon quality.Composition and structure of mulberry and non-mulberry cocoon filament,Scientific methods of cocoon testing and grading -Methods practiced in India, China and Japan. Estimation of renditta, kakame cost.

Unit: 2. Cocoon drying/stifling

Introduction, objective of cocoon drying/stifling, techniques of drying.Methods of drying / stifling-sun drying, steaming, hot air-conveyor system, methods. Merits and demerits of different methods.Cocoon conditioning and its importance.Cocoon sorting and storage.

Unit: 3. Pre-reeling process.

Cocoon Cooking-basic principles, objectives, cocoon cooking equipments and processes-open pan, three pan, pressurized system.Factors influencing cocoon cooking basin. Chemical reactions in cocoon cooking basin. Evaluation of cooked cocoons.Cocoon brushing-objectives, various methods of brushing.**Reeling water:** Consumption of water in silk reelingProperties of filature water, Influence of water quality on cooking and reeling efficiency, Water quality standards for silk reeling, Treatment methods.

Unit: 4.SILK REELING TECHNOLOGY

Introduction, Direct and Indirect system of reeling, various devices charaka, cottage basin, multiend, automatic reeling machines.Reeling devices for tasar and muga cocoons.Important parts of the reeling machine and their functions Jetteboute, button, guide pulleys, tension pulley, denier-controlling devices.Reeling process-Passage of thread in different reeling devices Influencing factors for quality raw silk.Reeling speed, calculation of production efficiency.**Silk re-reeling-** Objectives, re-reeling machine, pretreatment, process of re-reeling Skein finishing and packing.

Unit: 5. RAW SILK TESTING

Introduction to raw silk testing, importance of raw silk testing ,Conditioned weight test, boil off test,Quality tests-visual examination, winding, size, evenness, cleanness and neatness, tenacity and elongation, cohesion and exfoliation tests,Raw silk grading-Aims, BIS and ISA standards, Yarn numbering-Direct and Indirect systems-Dinier, text Count (Ne) By-products, and their utilization in silk industry for value addition

III.REFERENCES

1. Anon. 1972 Manual on Sericulture, Vol.3 Silk Reeling FAO, Agriculture Service Bulletin No. 72/3.
2. Byong Ho Kim. 1989. Filature water Engineering, Seoul national University Press, Republic of Korea.
3. Huang Guo Rui. 1988. Silk reeling, Oxford and IBH Publishing Co. Pvt. New Delhi.
4. Mahadeveppa, D., Halliyal, V.g., Shankar, A.G. and Bhandiwad, R. 2000 Mulberry Silk Reeling Technology, Oxford and IBh publishing Co. Pvt. Ltd. New Delhi.
5. Song, K.E and Lee, Y.W. 1973. Modern Silk Reeling Technology. Sericulture Expt. Station, Republic of Korea
6. Sonwalker, T.N. Handbook of silk Technology, New Age International Pvt.,ltd.
7. Yong Woo Lee. 1999. Silk Reeling and Testing Manual, FAO Agricultural services bulletin No. 136, Rome, Italy.

Web Links:

1.https://agritech.tnau.ac.in/sericulture/seri_silkworm5_pest%20cocoon%20tec.html
2.http://silkwormmori.blogspot.com/p/useful-links.html

Course.6. B: POST HARVEST COCOON PROCESSING TECHNOLOGY

IV. Learning Outcomes:

On successful completion of this practical course, student shall be able to:

Assessment of Cocoon Quality
Price Fixation
Marketing Skills

V. Practical (Laboratory) Syllabus: (30hrs) (Max.50Marks)

1.Evaluation of cocoons-Sorting of cocoons, percentage determination of good and defective cocoons by weight of different races and varieties.
2.Estimation of renditta on the basis of shell percentage and defective cocoons of different varieties.
3.Estimation of Filament Length,NBFL.
4.Estimation of Denier

VI. Lab References

Silk Reeling FAO Manual(WHO)

Web Links:

https://agritech.tnau.ac.in/sericulture/seri_silkworm5_pest%20cocoon%20tec.html
http://silkwormmori.blogspot.com/p/useful-links.html

Web resources suggested by the teacher concerned and the college librarian including reading material

VII. Co-Curricular Activities

a) **Mandatory**:*(Student training by teacher in field skills: Total 15 hrs., Lab:10 + field 05)*

1. For Teacher: Training of students by the teacher in laboratory/field for not less than15 hours on Cocoon Commercial Characteristics, Cocoon quality Assessment and Price fixation in Cocoon Markets

2. For Student: Students shall (individually) visit a Cocoon Markets, Research Stations, Silk exchange and report on the same in 10 pages hand written Fieldwork/Project work Report.
3. Max marks for Fieldwork/Project work Report: 05.
4. Suggested Format for Fieldwork/Project work: Title page, student details, index page, details of place visited, observations made, findings and acknowledgements.
5. (IE).Unit tests.

b) Suggested Co-Curricular Activities

1. Preparation of Model/Charts of Post Cocoon Technology
2. Preparation of Model Reeling M/Cs
3. Observation of Silk Reeling and Marketing activities in their area (Observation of any activity related Silk Industry in the vicinity of the college/village)
4. Assignments, Group discussion, Seminar, Quiz, Collection of Material, Video preparation etc., Invited lecture

A.P. State Council of Higher Education Semester-wise Revised Syllabus under CBCS, 2020-21

Course Code:

Four – year B.Sc. (Hons) Domain Subject: SERICULTURE
IV Year B. Sc.(Hons)–Semester –V

Course 7B: SILKWORM SEED TECHNOLOGY

Max Marks: 100+50

(Skill Enhancement Course (Elective), - Credits: 05)

I. Learning Outcomes:

Students at the successful completion of this course will be able
To study the process involved in the development of embryo.
To know the concept of seed area & organization of production of quality Dfls. To have a scientific knowledge of producing the quality eggs.

II.Syllabus: (*Total Hours: 90 including Teaching, Lab, Field Skills Training, Unit tests etc.)*

Unit 1:Silkworm seed production.

Seed cocoons-maintenance of basic stocks-characteristics of pure races multiplication-parent seed cocoons of multi and bivoltine varieties-norms of preservation of seed cocoons-statistical methods and sampling methods-marketing of seed cocoons-norms and price fixation.Disinfection activities in grainages-significance of disinfection – fumigation, mechanism of action of disinfectants. Model grainage: grainage plan-grainage equipments- description, utilization and maintenance.

Unit: 2 Grainage activities sorting of cocoons.

synchronization of eclosion-Sex Separation-pupa test-environmental conditions for healthy egg production-moth examination, importance and types (random and individual)-Preparation of eggs and sheet eggs, surface disinfection of eggs- hibernating and non hibernating eggs, egg cocoon ratio-cold storage of non diapausing eggs-cross breeding production technology.**Artificial hatching-**hot water electric stimulus, hot and cold acid treatment. Acid treatment after ordinary and short chilling. Maintenance of diapauses and its termination. Hibernation schedule for 4, 6 & 10 months. Aestivation, intermediate care and its importance.

Unit: 3 Incubation of eggs- Methods, environmental conditions required for incubation, post-ponement of hatching of eggs by temporary consignment.

Unit: 4.Seed organization

Principles-characteristics of silkworm breeds for seed maintenance of basic stocks-three tier seed multiplication programme-norms of maintaining seed cocoons in P_3, P_2 & P_1 stations-seed crop rearing-requirements.

Unit: 5.Grainage activities in non-mulberry silkworm varieties-techniques of egg production in tropical and temperate Tasar, Muga and Eri varieties (Tropical and Temperate).**Grainage management-**importance of productivity and quality-production, planning and control. Role of LSP"s.

III.REFERENCES

1. Anon. (1972). Manual on Sericulture.. Vol. II Silkworm Rearing FAO, Agriculture Services. Bulletin No. 72/2,Rome, Italy.
2. Narasimhanna and Ullal (1978). Handbook of silkworm egg production, CSB Publications,
3. Ullal and Narasimhanna (1978). Handbook of practical sericulture, CSB Publications, Bangalore.
4. Wang San-Wing (1994). Silkworm seed production Vol. III Oxford and IBH Publishing Co. Pvt. Ltd. New Delhi.
5. Narasimhanna. M.N. (1998). Manual on Silkworm egg Production. CSB., Govt. of India, Bangalore
6. Silkworm egg production, (Translated from Japanese), (1997), Oxford & IBH Publishing Co. New Delhi.
7. Tazima, Y. The silkworm egg.
8. Chapman, R.F. (1992). The Insects: Structure and functions.
9. Agrell, I.P.S (1964). Physiological and Biochemical changes during insect development. Academic Press, NewYork.
10. Counce S.J. (1973). The Causal analysis of Insect embryogenesis, Academic Press. New York.

Course.7. B: SILKWORM SEED TECHNOLOGY PRACTICAL SYLLABUS

IV. Learning Outcomes:

On successful completion of this practical course, student shall be able to:

Learn the Process of Loose Egg Praparation.
Learn the Process of Sheet Egg Praparation.
Organize a Private Commercial Grainage.

V.Practical (Laboratory) Syllabus: (30hrs) (Max.50Marks)

1. Model grainage plan and grainage equipments – wooden stand bamboo trays, wooden boxes, ant wells, thermometer, hydrometer, hygrometer, basin stand, cellules, moth crushing set, microscope, acid treatment equipment.
2. Handling of seed cocoons – selection and storage, sex separation in pupa and moth, moth emergence, refrigeration of male moths. Moth examination –individual and random moth examination-preparation of loose eggs and sheet eggs. – surface disinfection – cold storage-hibernation schedule –time of release.
3. Different methods of incubations- black boxing. Cold and Hot acid treatment for silkworm eggs.
4. Identification of Silkworm Eggs-Unfertilized-Diapause,Non diapauses, Dead and Unfertilized Eggs.
5. Determination of fecundity and hatching percentage, maintenance of records for grainage.

VI.Lab References

1. Narasimhanna. M.N. (1998). Manual on Silkworm egg Production. CSB., Govt. of India, Bangalore
2. Silkworm egg production, (Translated from Japanese), (1997), Oxford & IBH Publishing Co. New Delhi.

Web Links:

1.http://silkwormmori.blogspot.com/p/useful-links.html

2.https://sericulture.assam.gov.in/portlets/silkworm-seed-technology

Web resources suggested by the teacher concerned and the college librarian including reading material

VII.Co-Curricular Activities

a..Mandatory:*(Student training by teacher in field skills: Total 15 hrs., Lab:10 + field 05)*

1.For Teacher: Training of students by the teacher in laboratory/field for not less than15 hrs on Seed Production

2.For Student: Students shall (individually) visit a Grainage

3.Max marks for Fieldwork/Project work Report: 05.

4.Suggested Format for Fieldwork/Project work**:** Title page, student details, index page, details of place visited, observations made, findings and acknowledgements.

5.(IE).Unit tests.

b.Suggested Co-Curricular Activities

5. Preparation of Model/Charts of Grainage Building
6. Observation of Grainage activities in their area (Observation of any activity related Grainage in the vicinity of the college/village)
7. Assignments, Group discussion, Seminar, Quiz, Collection of Material, Video preparation etc., Invited lecture

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A.P. State Council of Higher Education

Semester-wise Revised Syllabus under CBCS, 2020-21

Course Code:

Four – year B.Sc. (Hons) Domain Subject: SERICULTURE
IV Year B. Sc.(Hons)–Semester –V

Max. Marks: 100+50

Course.6 C- **ECOFRIENDLY NATURE FARMING**
(Skill Enhancement Course (Elective), -Credits: 05)

I. Learning Outcomes:

Students at the successful completion of this course will be able to learn and gain practical knowledge

Students will understand the factors affecting the need to find sustainable practices for production of food, feed and fiber crops and how to implement and evaluate them.

Students will understand how the environment influences plant growth and crop yields, and ways to modify the environment to improve plant growth and yields.

Students will understand how to propagate, plant, and sustainably grow, manage and harvest fruit, vegetable, grain and/or forage crops within various environmental, marketing and financial conditions.

Students will be able to identify soil types and how they are formed and ways to modify soil structure and drainage to reduce erosion and improve water quality and water availability to plants.

II. Syllabus: (*Total Hours: 90 including Teaching, Lab, Field Skills Training, Unit tests etc.)*

Unit 1: Organic Farming-

Need - Objectives-Organic inputs &Techniques. Bio Fertilizers –Plant nutrients – Definition and Scope of Biofertilizers – Types of Bio Fertilizers –Rhizobium-Azotobacter-Cyano bacteria-Azolla-PSM-AM fungi-SSB-PGPRB- Mass Production of Bio fertilizers-Method of preparation –

Unit 2: Application of biofertiizers-

N2 fixing-phosphate solubilizing-Phosphate mobilizing-Bio fertilizers for Micronutrients-Plant growth promoting Rhizo bacteria-Liquid Bio fertilizers-Charecteristics-Methodology-value of Technology-Constraints in Bio fertilizer technology-Economics

Unit3: Green Manuring- Definition and Scope of green manuring-Green manure crops-Cropping systems-Plant species suitable for green manures-Manures Vs Fertilizers –Types of Green manures – production of green manures – Application of green manures

Unit 4: Vermicompost Technology:-

Definition and Scope of Vermicompost Biopesticides – Definition and Scope of Biopesticides – Types of Biopesticides – Botanical origin Biopesticides -Microbial origin- Nanotech origin- Methods of Preparation of Bio pesticides – Application of Bio pesticides.

Unit 5: Mechanization in Sericulture-

Definition and scope – Machines used in Moriculture – machines used in Rearing of Silkworms – Management and maintenance of Machinery used in sericulture.

III. References

1. Hortmann and Kesler (1993) Plant Propagation, principles and practices. Prentice Hall, Hemel Nemstead.
2. Krishnamurthy, N. (1981) Plant growth substances including application in Agriculture. Tata McGraw Hill Pub. Co. Ltd. New Delhi.
3. Shankar, M.A (1998) Handbook on mulberry Nutrition, Multiplex, Bangalore.
4. Subba Rao, N.S (1998) Biofertilisers in Agriculture. Oxford & IBH Pub. Co, Pvt. Ltd, New Delhi.
5. A text Book on Mulberry Crop Protection. Govindaiah, V.P Gupta, D.D Sharma, S. Rajadurai and V. Nishitha Naik, Published by Central Silk Board, Bangalore-68, India. 2005.

Web Links- https://organic-farmknowledge.org/

Course 6 C : ECOFRIENDLY NATURE FARMING PRACTICALS

IV.Learning Outcomes:

On successful completion of this practical course, student shall be able to:

Students will understand how soil fertility is determined and how plant nutrient deficiencies are identified, and means of improving soil fertility and adding nutrients for plant growth.

Students will be able to recognize how soil type and topography affects recommended agricultural, commercial and residential use and water quality at varying locations.

Students will understand how to identify and sustainably manage plant diseases in various production systems.

V. Practical (Laboratory) Syllabus: (30hrs) (Max.50Marks)

1.Preparatin of Vermicompost
2.Preparation of Biopesticides
3.Preparation of Biofertilizers
4. Rising of Green Manure crop
5.Extract of Vermiwash
6.Preparation of Pancha gavya and Jeevamrutham
7.Amruth Mitti

VI. Lab References

1. Hortmann and Kesler (1993) Plant Propagation, principles and practices. Prentice Hall, Hemel Nemstead.
2. Krishnamurthy, N. (1981) Plant growth substances including application in Agriculture. Tata McGraw Hill Pub. Co. Ltd. New Delhi.
3. Shankar, M.A (1998) Handbook on mulberry Nutrition, Multiplex, Bangalore.
4. Subba Rao, N.S (1998) Biofertilisers in Agriculture. Oxford & IBH Pub. Co, Pvt. Ltd, New Delhi.
5. A text Book on Mulberry Crop Protection. Govindaiah, V.P Gupta, D.D Sharma, S. Rajadurai and V. Nishitha Naik, Published by Central Silk Board, Bangalore-68, India. 2005.

Web Links

https://organic-farmknowledge.org/

Web resources suggested by the teacher concerned and the college librarian including reading material

VII. Co-Curricular Activities

a) **Mandatory**:*(Student training by teacher in field skills: Total 15 hrs., Lab:10 + field 05)*

1. For Teacher: Training of students by the teacher in laboratory/field for not less than15 hours on Farming techniques- disease diagnostic techniques—concepts .
2. For Student: Students shall (individually) vermeries and report on the same in 10 pages hand written Fieldwork/Project work Report.
3. Max marks for Fieldwork/Project work Report: 05.
4. Suggested Format for Fieldwork/Project work: Title page, student details, index page, details of place visited, observations made, findings and acknowledgements.
5. (IE).Unit tests.

b) Suggested Co-Curricular Activities

1. Establishment of Vermicompost Unit
2. Culture of Biopesticides .
3. Observation of Organic farming activities in their area (Observation of any activity related to aquaculture in the vicinity of the college/village)
4. Assignments, Group discussion, Seminar, Quiz, Collection of Material, Video preparation etc., Invited lecture

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A.P. State Council of Higher Education

Semester-wise Revised Syllabus under CBCS, 2020-21

Course Code:

Four – year B.Sc. (Hons) Domain Subject: SERICULTURE
IV Year B. Sc.(Hons)–Semester –V

Max. Marks: 100+50

Course.7C: VALUE ADDITION IN SERICULTURE
(Skill Enhancement Course (Elective), -Credits: 05)

I. Learning Outcomes:
Students at the successful completion of this course will be able

To make the students understand about various value-added products prepared from different wastes generated during various stages of sericulture.

To provide hands-on training in the preparation of value added products from sericulture wastes obtained during various stages of silk production

Students will be able to identify different types of sericulture wastes

Students will get hands on experience in the preparation of various valued added products from sericulture and also they get entrepreneurial skills.

II. Syllabus: (*Total Hours: 90 including Teaching, Lab, Field Skills Training, Unit tests etc.)*

UNIT-I: General account of by products /value added products in Sericulture

1.Importance and Scope of Sericulture value added/by product industry in India

2.Entrepreneurship development in by-products of Sericulture

UNIT-II: Pharmaceutical value of mulberry

1. Mulberry Leaf chemical composition

*2.Medicinal value/*pharmaceutical utility *of mulberry* leaf, mulberry fruit, mulberry stem and root

UNIT-III :Value added products of Mulberry

1. Different recipes from mulberry leaf and fruit

2. Value added products from mulberry leaf , stem, root and fruit

UNIT-IV :Value added products of Cocoon

1.Silkworm rearing bed refuge for vermi compost preparation and Mushroom cultivation - Silkworm larvae for human consumption- nutrition value-

2 Silkworm as biotechnological and laboratory tool

3. Cocoon based handicrafts, defective and double cocoons for production of dupion silk

UNIT-V: Value added products of Silk

1. ValueAdding Potentials and Prospects for Silk– types of silk wastes – spun silk- noil yarn and its utility.

2. Silk worm pupae as food material and - pupal oil extraction and its uses

3. Application of silk protein fibroin and Sericin as a biomaterial and other Seri-by-products- pharmaceutical application- biomedical application- cosmetic application

III. References

1. Plant Cell Culture: A Practical Approach by R.A. Dixon & Gonzales, IRL Press.
2. Plant Molecular biology by D. Grierson & S.N. Covey Blackie, London
3. Recombinant DNA (2nd Ed.) Watson J.D Gilmanm, workowski J. and Zoller M. Scientific American Books, 1992.

7C VALUE ADDITION IN SERICULTURE PRACTICALS

IV.Learning Outcomes:

To provide hands-on training in the preparation of value added products from sericulture wastes obtained during various stages of silk production

Students will be able to identify different types of sericulture wastes

Students will get hands on experience in the preparation of various valued added products from sericulture and also they get entrepreneurial skills.

V. Practical (Laboratory) Syllabus: (30hrs) (Max.50Marks)

1. Identification of wastes in different phases of Sericulture:
   a. Mulberry cultivation
   b. Silkworm rearing & Seed production
   c. Silk reeling and Weaving
   d. Silk cocoon handicrafts preparation
2. Demonstration on
   a. Vermicompost preparation using Sericulture waste
   b. Mushroom cultivation using silkworm rearing waste
3. Preparation of mulberry tea using leaf
   Mulberry jam preparation using mulberry fruit
   Recipes from mulberry leaf

VI LAB References

- Plant Cell Culture: A Practical Approach by R.A. Dixon & Gonzales, IRL Press.
- Plant Molecular biology by D. Grierson & S.N. Covey Blackie, London
- Recombinant DNA (2nd Ed.) Watson J.D Gilmanm, workowski J. and Zoller M. Scientific American Books, 1992.

Web Links

http://site.iugaza.edu.ps/mwhindi/files/BIOTECHNOLOGY-PROCEDURES-AND-EXPERIMENTS-HANDBOOK.pdf

Web resources suggested by the teacher concerned and the college librarian including reading material

VII.Co-Curricular Activities

a..Mandatory:*(Student training by teacher in field skills: Total 15 hrs., Lab:10 + field 05)*

1.For Teacher: Training of students by the teacher in laboratory/field for not less than15 hrs on Principles of Biotechnology

2.For Student: Students shall (individually) visit a research Institute where tissue culture, transgenic experiments are carried

3.Max marks for Fieldwork/Project work Report: 05.

4.Suggested Format for Fieldwork/Project work: Title page, student details, index page, details of place visited, observations made, findings and acknowledgements.

5.(IE).Unit tests.

b.Suggested Co-Curricular Activities

1. Preparation Nutrient Medium
2. Observation of RDNA Research activities in their area (Observation of any activity related to Tissue culture
3. Assignments, Group discussion, Seminar, Quiz, Collection of Material, Video preparation etc., Invited lecture

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A.P. State Council of Higher Education

Semester-wise Revised Syllabus under CBCS, 2020-21

Course Code:

Four – year B.Sc. (Hons) Domain Subject: SERICULTURE

IV Year B. Sc.(Hons)–Semester –V

Max. Marks: 100+50

6D. SERI BUSINESS- AN EMERGING ENTREPRENEURESHIP

(Skill Enhancement Course (Elective), -Credits: 05)

I. Learning Outcomes

It will make the students to understand the present status and lacunae of the industry.

Students will understand the managerial skills and also cost benefit ratio which is helpful for the future entrepreneurs.

The main focus of the paper is to motivate the students for self employment and to discuss various issues of entrepreneurial opportunities in sericulture industry.

The paper mainly comprises of economics, cost benefit ratio and managerial aspects which are essential to become an entrepreneur.

II. Syllabus: (*Total Hours: 90 including Teaching, Lab, Field Skills Training, Unit tests etc.)*

UNIT.I. Entrepreneurship.

1. Concept
2. Characteristic features of enterpreunership
3. Factors contributing to women enterpreunership – Social, cultural and economic factors
4. Role of family in capacity building of women enterpreunership

UNIT.II. Entrepreneurship Development programmes and institutional support.

1. Women enterpreunership development – trends, patterns and development
2. Role of Central Silk Board and the State to promote Entrepreneurship in Sericulture.

UNIT.III. Technical knowhow pertaining to:

(i) Mulberry cultivation
(ii) Seed production and
(iii) Chawki rearing
(iv) Silkworm rearing
(v) Reeling and twisting
(vi) Weaving

UNIT.IV. Entrepreneurship opportunities in Sericulture –

(i) SWOT analysis
(ii) Management techniques – planning, budgeting, coordinating, controlling and decision making
(iii) Management of seri-entrepreneurship activities –

UNIT.V. Entrepreneurship in sericulture

(i) production of vermicompost, disinfect, Biofertilizers and grainages.
(ii).Mulberry and cocoon production, seed production, chawki rearing, silk reeling and weaving iii. achievements in sericulture by progressive farmers.

III.REFERENCES:

1. David E. Gumpert, How to Create a successful Business Plan, Inc. Publishing, 1990.
2. Robert D. Hisrich and Michael P. Peters, Entrepreneurship: Starting, Developing, and Managing a New Enterprise, 3rd edition, Irwin, 1995.
3. Ronald E. Merrill and Henry D. Sedgwick, The Mew Venture Handbook: Everything you Need to Know to start and Run Your Own Business, new and updated edition, AMACOM, 1993.
4. Karl, H. Vesper, (1990) New Venture Strategies, revised edition, Prentice Hall.

Course.6,D: SERI BUSINESS- EMERGING ENTREPRENEURESHIP

IV. Learning Outcomes:

On successful completion of this practical course, student shall be able to:

Silkworm Seed Production as a business opportunity
Commercial Silkworm Rearing - the shortest duration crop with monthly income plan. Production of disinfectants used in sericulture
Production of Bio-control agents for pest control in Sericulture

V.Practical (Laboratory) Syllabus: (30hrs) (Max.50Marks)

1. Estimation of quantity of requirement of disinfectant solution for the rearing house and method of disinfection
2. Demonstration of management of practices against silkworm pests
3. Preparation of different disinfectant solutions recommended in Sericulture

VI. Lab References

1. Deshpande M.V. (1984) Entrepreneurship of Small-Scale Industries: Concept, Growth & management,Deep & Deep Publication, D-1/24, Rajouri Garden, New Delhi.
2. Practical Manual Certificate course in sericulture BLP-003Indira Gandhi national open university School of Agriculture

Web Links

https://www.businesskashmir.com/2021/06/05/seri-business-emerging-entrepreneurship-model-in-sericulture/

Web resources suggested by the teacher concerned and the college librarian including reading material

VII.Co-Curricular Activities

a..Mandatory:*(Student training by teacher in field skills: Total 15 hrs., Lab:10 + field 05)*

1.For Teacher: Training of students by the teacher in laboratory/field for not less than15 hrs on Seed Production

2.For Student: Students shall (individually) visit a Grainage

3.Max marks for Fieldwork/Project work Report: 05.

4.Suggested Format for Fieldwork/Project work**:** Title page, student details, index page, details of place visited, observations made, findings and acknowledgements.

5.(IE).Unit tests.

b.Suggested Co-Curricular Activities

4. Preparation of Model/Charts of Grainage Building
5. Observation of Grainage activities in their area (Observation of any activity related Grainage in the vicinity of the college/village)
6. Assignments, Group discussion, Seminar, Quiz, Collection of Material, Video preparation etc., Invited lecture

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A.P. State Council of Higher Education

Semester-wise Revised Syllabus under CBCS, 2020-21

Course Code:

Four – year B.Sc. (Hons) Domain Subject: SERICULTURE
IV Year B. Sc.(Hons)–Semester –V

Max. Marks: 100+50

7D. SERI BIOTECHNOLOGY

(Skill Enhancement Course (Elective), -Credits: 05)

I. Learning Outcomes

To understand the Principles of biotechnology
To understand the cell, tissue and organ culture techniques.
To acquaint with the molecular marker aided breading techniques

II. Syllabus: (*Total Hours: 90 including Teaching, Lab, Field Skills Training, Unit tests etc.)*

UNIT.I. Scope and importance of biotechnology, in Sericulture

Recombinant DNA Technology: cloning and expression of vectors-cloning vectors for recombinant DNA (plasmids, phages, cosmids, virus, transposons, YAC, MAC). Binary and shuttle vectors. Gene transfer methods in plants; Target cells for transformation; Gene transfer techniques using *Agrobacterium*. Selectable and scanable markers; Agro infection and gene transfer in mulberry; DNA mediated gene transfer (DMGT). Transgenic plants in crop improvement, molecular farming and regulated gene expression.

UNIT.II Insect cell and tissue culture: History and scope of animal cell and tissue culture; advantages and disadvantages. Culture media for cell and tissues: Culturing procedures.

Polymerase chins reaction (PCR): Gene amplification, application of PCR in silkworm biotechnology

UNIT.III Plant cell and Tissue culture techniques: Introduction and historical background of plant morphogenesis and tissue culture, laboratory requirement for plant tissue culture, culture media. Cell culture; applications of cell and tissue culture. Application of fundamental principles of biotechnology for improving silk production. Use of translocated W-chromosome for sexing animals-genetic correlation of traits. Making new textile fibres, improvement of silkworm strains, marker assisted breeding. Application of biometrical genetics. Quantitative trait loci (QTL) in silkworm.

UNIT.IV. Genetic resistance of silkworm, *Bombyx morito* bacterial and viral diseases. Immune response against bacterial and viral diseases in the silkworm, Bombyx mori; Regulation of host gene expression, inducible anti-bacterial and anti-viral proteins of *Bombyx mori.*

UNIT.V. Non-mulberry silkworm and biotechnology:

Preservation of endangered non-mulberry silk through biotechnological approach.

III.REFERENCES:

- Plant Molecular biology. Grierson D.and Lovely S.N.Blackie, London, 1984
- Genetic Engineering in plants. Kosuge T.Meredith, C.P and Hollender S.Plenum press, New York, 1989.
- Cellular and molecular biology. Goldberg R B. Alan R.Liss Inc. New York, 1982.
- Plant biotechnology. Ignacimuthu V.L. Oxford IBH Publishing Company, New Delhi, 1995.
- Genetic manipulation for crop improvement. Chopra V.L Oxford IBH publishing company, New Delhi, 1985.
- Molecular Biotechnology. B.R Glick. and Pasbernak. J. J.American Society for molecular biology (ASM press), 1994.
- Recombinant DNA (2nd Ed.) Watson J.D Gilmanm, workowski J. and Zoller M. Scientific American Books, 1992.
- Principles of gene manipulation. Old, R.W. and Primrose S.B Blackwell Scientific Publications 1994.
- Drosophila-A practical Approach. D.B. Roberts, IRL Press, 1989.

- Animals with Novel genes. Maclean.N. Cambridge"s Univ. Press, London, 1987.
- Plant Tissue Culture: Applications and Limitations by S.S. Bhojwani (1990), Elsevier, Amsterdam.
- Plant Cell Culture: A Practical Approach by R.A. Dixon & Gonzales, IRL Press.
- Plant biotechnology in Agriculture by K. Lindsey and M.G.K. Jones prentice hall, New Jersey 1990.
- Plant Molecular biology by D. Grierson & S.N. Covey Blackie, London

Course.7 D: SERI BIOTECHNOLOGY

IV. Learning Outcomes:

On successful completion of this practical course, student shall be able to:

To understand the Principles of biotechnology
To understand the cell, tissue and organ culture techniques.
To acquaint with the molecular marker aided breading techniques

V.Practical (Laboratory) Syllabus: (30hrs) (Max.50Marks)

1. Preparation of media for plant and animal cell cultures.
2. Trypan blue exclusion cell viability.
3. Trypsinisation of monolayer and sub culture. (Tissue for cell-separation)
4. Isolation of genimi DNA from microbial, animal and plant cells.
5. Restriction digestion of DNA – agarose gel electrophoresis of DNA fractions.
6. SDS – 2 Dimensional electrophoresis of proteins
7. DNA amplication by PCR and gel documentation.
8. DNA sequencing (Demonstration) DNA finger printing (RAPD & universal primer method)
9. Southern and Northern blotting & DNA cloning
10. Artificial seed production

VI Lab references

1. Plant Cell Culture: A Practical Approach by R.A. Dixon & Gonzales, IRL Press.
2. Plant Molecular biology by D. Grierson & S.N. Covey Blackie, London
3. Recombinant DNA (2nd Ed.) Watson J.D Gilmanm, workowski J. and Zoller M. Scientific American Books, 1992.

http://site.iugaza.edu.ps/mwhindi/files/BIOTECHNOLOGY-PROCEDURES-AND-EXPERIMENTS-HANDBOOK.pdf

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VII.Co-Curricular Activities

a..Mandatory:*(Student training by teacher in field skills: Total 15 hrs., Lab:10 + field 05)*

1.For Teacher: Training of students by the teacher in laboratory/field for not less than15 hrs on Principles of Biotechnology

2.For Student: Students shall (individually) visit a research Institute where tissue culture, transgenic experiments are carried

3.Max marks for Fieldwork/Project work Report: 05.

4.Suggested Format for Fieldwork/Project work: Title page, student details, index page, details of place visited, observations made, findings and acknowledgements.

5.(IE).Unit tests.

b.Suggested Co-Curricular Activities

1. Preparation Nutrient Medium
2. Observation of RDNA Research activities in their area (Observation of any activity related to Tissue culture
3. Assignments, Group discussion, Seminar, Quiz, Collection of Material, Video preparationetc., Invited lecture

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Suggested Question Paper Pattern

Semester-wise Revised Syllabus under CBCS, 2020-21

Course Code

Four – year B.Sc.(Hons) Domain Subject: SERICULTURE

IV Year B. Sc.(Hons)–Semester –V

Max.Marks:75 Time:3 hrs

SECTION - A(Total: 10 Marks)

Very Short Answer Questions (10 Marks: 5x2)

1. .....
2. .....
3. .....
4. .....
5. .....

SECTION - B (Total: 5x5=25Marks)

(Answer any Five questions. Each answer carries 5 marks)

(At least1 question should be given from each Unit)

6. .....
7. .....
8. .....
9. .....
10. .....
11. .....
12. .....
13. .....

SECTION C

(Total: 4x10 = 40 Marks)(Answer any four questions. Eachanswercarries10 marks

(Atleast1questionshould be given from each Unit)

14. .....
15. .....
16. .....
17. .....
18. .....
19. .....

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Draft Syllabus Prepared by;

1. Dr.S. Smitha, Principal, STSN Government Degree College, Kadiri, SSS Dist. A.P

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PRINCIPAL
STSN Govt.DEGREE COLLEGE
KADIRI - 515 591
Sri Sathya Sai (Dist).

STSN GOVT. DEGREE COLLEGE Dt. 16-04-2022 SRI SATYA SAI DT. Pin-515 591 KADIRI

PRINCIPAL
STSN GOVERNMENT DEGREE COLLEGE
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