

SERICULTURE SYLLABUS FOR CONDUCTING WRITTEN EXAMINATION FOR DIRECT RECRUITMENT OF TEACHING POSTS IN THE CADRE OF ASSISTANT PROFESSORS AT UASM		
Sl. No.	Subject	Content
1.	Mulberry Production Technology	Overview and Scope of mulberry sericulture Scope of mulberry sericulture, an overview of sericulture industry in the world and India. Leaf quality requirements, factors influencing mulberry leaf yield and quality. Scope for mechanization in mulberry cultivation. Varieties of mulberry - Mulberry varieties, Traditional mulberry varieties, popular mulberry varieties in different climatic zones, high yielding varieties, varieties for rainfed condition, varieties for specific conditions. Mulberry production - Raising of mulberry saplings and planting - Technology for raising of saplings for bush and tree type mulberry cultivation. Preparation of bed, planting material, transportation, storage, planting, weeding, fertilizer application and disease and pest management, uprooting, transportation and planting in main field. Establishment of mulberry garden - Package of practices for rainfed and irrigated mulberry cultivation, separate chawki garden, tree mulberry, mulberry cultivation in hilly areas. Selection of land, land preparation, planting, initial care and maintenance for different methods of mulberry cultivation and pruning practices. Mechanization in mulberry cultivation, intercropping, organic farming and IFS component. Manure and fertilizer schedule, irrigation schedule, use of biofertilizers for enhanced yield, use of growth hormones and growth regulators. Mulberry protection - Mulberry pests and their management - Mulberry pest status, occurrence, type of damage, symptoms, crop loss, life-cycle, different methods of management techniques, Integrated Pest Management (IPM) in mulberry. Mulberry diseases and their management -

		Mulberry diseases, occurrence, damage, symptoms, crop loss and different methods of management techniques and Integrated Disease Management (IDM) in mulberry.
2.	Genetics and Breeding of Mulberry	Taxonomy and botanical description and classification of mulberry - Origin and diversity studies of mulberry Centre of origin and diversity studies of mulberry, Mulberry species. Taxonomy of the genus Morus. Botanical description of the Morus spp. Study of floral structure, biology and pollination - Reproduction and genetic constitutions in mulberry – asexual reproduction- characteristics of mulberry florets- sexual behaviour-anthesis-reproductive variability. Pollination in mulberry. Cytology of mulberry, cell division- mitosis and meiosis and their significance. Karyomorphological studies. Microsporogenesis and Megasporogenesis in mulberry. Embryological studies of mulberry. Genetic basis and general concept of mulberry breeding - Mulberry germplasm and breeding methods - Mulberry germplasm - Conventional methods of breeding - Non-conventional methods of breeding.
3.	Systematics and Morphology of Sericigenous insects	Morphological studies - Introduction to morphology - Introduction, general morphology with special reference to the morphology of sericigenous insects. Morphology of integument - Structure, segmentation and out growths, body regions, appendages and other structures, their modifications in general. Morphology of body segments and appendages - Morphology of head, thorax, abdomen and their appendages, antennae, mouthparts, setae, legs, cerci, styli and others. Morphology of reproductive organs – modifications. Systematics of sericigenous insects - Introduction, scope and methods - Introduction to systematics: Concept, scope and applications, methods involved in systematics. Type concept

		- Holotype, syntype, erection of type and preservation of type. Preparation of keys - Key formation for sericigenous insects to identify orders, families, genera, species and tribes/ eco-races. Zoological nomenclature - Binomial nomenclature; concept, scope and application.
4.	Silkworm Egg Production Technology	Organization of egg production - Three tier multiplication of silkworm seeds - Organization of egg production. Breeder stock, foundation stock and commercial egg production (egg cards and loose egg preparation). Seed Act - Seed legislative act, 1959. Seed Act 2010. Grainage - Establishment of grainage - Location of grainage, plan of grainage, grainage equipments and capacity of grainage. Grainage activities - Seed areas, seed cocoon market, procurement and transportation of seed cocoons, selection, storage, handling and processing of seed cocoons. Sex separation in pupal stage, moth emergence, synchronization of moth emergence, pairing, depairing, moth examination, laying preparation on egg cards/ loose egg production, rejection of defective eggs, disinfection and washing and incubation of eggs. Artificial Hatching of eggs - Production of hybrid eggs - Production of hybrid seeds (Multivoltine $\times$ Bivoltine), (Bivoltine $\times$ Bivoltine), (Bivoltine $\times$ Bivoltine) $\times$ (Bivoltine $\times$ Bivoltine) (Double Cross Hybrid). Grainage pests. Economics of egg production and special determinants. Artificial methods of hatching - Artificial methods of hatching of bivoltine eggs, cold and hot acid treatments, physical and chemical methods, hibernation schedules.
5.	Silkworm Rearing Technology	Planning for silkworm rearing - Planning for chawki rearing and late age silkworm rearing - Planning for rearing, criteria to be considered for rearing, plan of rearing house for chawki

		and late age silkworm rearing, rearing equipment, measurement and regulation of environmental factors. Disinfection and disinfectants - Disinfection of rearing room and equipment. Mulberry leaf preservation - Planning for silkworm rearing; harvesting, transportation and preservation of mulberry leaves. Incubation of silkworm eggs - Different methods of incubation of silk moth eggs, black-boxing, hatching and brushing. Silkworm rearing - Early instar silkworm rearing - Early instar silkworm (Chawki) rearing, different methods, environmental conditions, quality of leaf, feeding, bed cleaning, spacing. Chawki rearing centres. Late age silkworm rearing - Different methods of late age silkworm rearing, environmental conditions, feeding and bed spacing. Management of silkworm during moulting. Mounting, harvesting and marketing of silk cocoon - Mounting of ripe worms and cocoon marketing - Mounting of ripe worms, different kinds of mountages. Rearing house and equipment for shoot method of rearing. Comparison of different rearing methods - Comparing shoot feeding and shelf method of rearing.
6.	Genetics and Breeding of Silkworms	Genetics of silkworm – Cytology - Ancestor and cytological basis of origin of silkworms. Cytological aspects of silk gland and achievements in deciphering molecular biology of silk gene. Hormonal control mechanisms. Reproductive biology - Phenomena of spermatogenesis and oogenesis with relevance to crossing over, cell division types in silkworms, synaptonemal complex, fertilization, chromosomes in silkworms. Sex determination, parthenogenesis, polyploidy, mosaics. Inheritance of characters - Hereditary traits of importance in egg, larva, pupa-cocoon and adult. E- Group as a tool in genetics and significance. Linkage groups in

		silkworms. Sex linked inheritance, Quantitative and Qualitative Characters in silkworm breeding. Genetics of cocoon colours. <i>Bombyx mori</i> L. genome and latest genome sequence, Translocation of characters in metamorphic stages. Breeding of silkworm - Silkworm breeding resources - Multivoltine and bivoltine races and hybrids. Silkworm germplasm and resource potential. Methods of silkworm breeding - Methods of silkworm breeding and their importance with relevance to Indian scenario. Breeding for thermotolerance, disease resistance, special characters required for the nation and also for silk export. Sex linked and sexlimited races- their importance and need of the hour, Authorization and release of silkworm races.
7.	Diseases and Pests of Silkworms	Silkworm diseases and their management - Importance and classification - Taxonomic position of silkworm disease causing organisms including viruses, bacteria, fungi, protozoans, classification of various pests causing economic loss to silkworms, and their importance. Silkworm pathogens, disease development and diagnosis - Occurrence, causative agent, symptoms and infection, source of infection, predisposing factors, seasonal incidence, transmission and management of the pathogens individually including viral, fungal, bacterial, protozoan and mixed infections. Diagnosis of different pathogens based on symptoms (external and internal), patho-physiology and histopathology. Management of silkworm diseases - Comparative etiology of silkworm pathogens. Management, prevention and control of diseases of silkworms, regulation of predisposing and environmental factors contributing to diseases, rearing disease resistant breeds of silkworm. Management of alternative hosts of silkworm disease causing pathogens

		(lepidopteran crop pests and pests of mulberry). Intergrated disease management. Silkworm pests and their management - Ujifly, <i>Exorista bombycis</i> Louis - a major pest of silkworms - History and taxonomy, Bio-ecology, Life cycle-egg, maggot, pupa, adult, oviposition, damage and extent of damage caused, prevention and control, biological control and IPM. Other pests and predators affecting silkworm crop and their management - Pests and predators causing loss to silkworms and cocoons including Ants, type of damage, management. Straw itch mite, life cycle, kind of damage, management. Dermestid beetles, classification, life cycle, nature of damage, management. Rats, squirrels, lizards, earwigs, etc., Pesticide toxicity - Poisoning by agricultural chemicals to silkworms, acute and chronic symptoms of poisoning by different agricultural chemicals. Residual toxicity of chemicals on mulberry and damage caused, prevention and control.
8.	Silk Technology	Cocoon as raw material - Physical characteristics - Introduction; Importance and use of silk, cocoon quality. Physical characteristics- cocoon colour, shape, size, wrinkles, uniformity and compactness. Commercial characteristics - Cocoon weight, shell weight, shell percentage, filament length, denier, non-breakable filament length, reelability and raw silk percentage. Transaction of cocoons - Defective cocoons - Types of defective cocoons, reasons for defective cocoons, cocoon sorting, methods of sorting, estimation of defective cocoons per kg. Technological aspects. Selection of raw material for silk reeling – scientific method of testing and classification of cocoons. Cocoon marketing - Marketing based on visual observation and based on quantitative parameters, open auction system (Quality based pricing) and

		E- transaction. Limitations of open auction system and estimation of renditta. Steps in silk reeling - Cocoon stifling - Cocoon cooking and brushing – Cocoon reeling - Re-reeling - Reeling water. Silk testing and examination - Different methods of silk examination - Different silk examination methods and lacing, book and bale making. Silk testing and grading - Silk testing and grading-grading of raw silk based on I.S.A., silk testing tools for physical (visual inspection) and mechanical properties of silk. Procedure adopted for conducting physical and mechanical properties of silk and equipment's used for testing of raw silk. Post reeling technology - Doubling, twisting and weaving - Marketing of raw silk.
9.	Non-mulberry Sericulture	Underexploited less known non-mulberry silks - Scope, importance and distribution in the World - Uses of less known sericigenous species for commercial exploitation, distribution pattern on different host plants and their statistics. Introduction to Anaphe, Coan and Fagara silks - Systematics, morphology and cocoon characteristics of Anaphe, Fagara, Coan silks and possibilities of their exploitation. Commercially exploited non-mulberry silks - Scope, importance and their distribution in the world - Scope, importance, distribution in the country and World of Eri, Tropical Tasar, Temperate Tasar and Muga silks and their primary and secondary host plants. Rearing of Eri silkworm - Rearing of Tasar (tropical/ temperate) - Rearing of Muga silkworms - Economics of non-mulberry silkworm rearing - Economics of non-mulberry silkworm rearing, viz., eri, tasar and muga silkworm rearing and their cost benefit ratio.