

Detailed Course Structure of proposed Master of Animal Science

Module Code and Title	Brief Syllabus Outline
AS 51201- Reproductive Physiology and Endocrinology	Gametogenesis; Physiology and endocrinology of puberty; Ovulation; Fertilization; Conception; Implantation; Periods of the embryo, the fetus, Parturition and Post-partum. Hormonal regulation of mammalian reproductive cycles and seasonal patterns with emphasis on farm animals; Nutritional and stress effects on reproductive endocrinology; Mechanism of hormone action.
AS 51202 - Ruminant Production	Principles of ruminant management (Housing, welfare and behavior), Practical aspects of dairy management (calf, heifer, pregnancy, calving, milking and Dry cows), Stud Bull management, fertility management, Clean milk production, Small Ruminant management.
AS 51203 - Non-ruminant Production	Origin, utility and domestication of miscellaneous poultry species; Breeds of different type of poultry; Methods of rearing and special management practices of the above species; Housing requirements; Nutrient requirements; Feeding standards and production rates; Disease control. Selection and breeding of broilers; Planning of broiler farms; Management of broilers: housing, feeding and disease prevention; Factors affecting broiler performance and their quality; Cost-benefit analysis of broiler production; Broiler production systems in different regions. Management of Rabbits: Breeds; Selection of good rabbits for reproduction; Housing and equipment; Rabbit production systems; Handling and management of kids, growers, does and bucks of rabbits; Record keeping; Health and diseases; Slaughtering process.
AS 51204 - Animal Genetics and Breeding	Introduction to animal genetics, Cytogenetics and molecular genetics in farm animal breeding, Gene and gene interactions, basic population genetics, relationship and Inbreeding, Genetic and Phenotypic variance components, estimation of Heritability, Repeatability, Prediction of Breeding values, Introduction to Livestock improvement, Different breeding methods, Genetic improvements of dairy cattle, goats, swine and buffalos, Tropical livestock breeding systems.
AS 51205 - Animal Nutrition - Ruminant	Principles of ruminant digestion and metabolism; Some important species of rumen bacteria, protozoa etc.; Carbohydrate metabolism in ruminants; Carbohydrate fermentation in the

	<p>rumen; Nitrogen metabolism in the ruminant conversion of non-protein nitrogen (NPN) to rumen microbial protein synthesis; Synthesis of microbial protein from NH₃ in the rumen; By-pass protein possible reasons for the low utilization of NPN (urea) in Sri Lanka ;Suitable methods for feeding of NPN (urea) in Sri Lanka compared to that of developed countries; Livestock Feedstuffs; Protein quality evaluation; Energy Evaluation; Common methods for the evaluation of the nutritive value of feedstuffs ;. Digestibility Studies.</p>
AS 51206 - Animal Nutrition - Non-Ruminant	<p>Introduction to animal nutrition, comparative digestive physiology, important nutrients for livestock; classification of nutrients and feedstuffs, functions, metabolism and sources, feed resources for livestock, analysis and evaluation of livestock feeds, setting nutrient requirements for maintenance, growth, milk production and gestation, nutrition and environment, nutrition and animal health, nutrition and reproduction, principles of ration formulation for ruminants, swine and poultry, nutrition and feeding of dairy cattle, poultry, swine, goat, fish and companion animals, experimental techniques in animal nutrition.</p>
AS 51207 - Animal Genetic Resources and Conservation	<p>Definitions of Biodiversity, Biodiversity of Sri Lanka, levels of bio diversity, Agro diversity and livestock diversity, present status of Animal Genetic Resources and Conservation in the world and in Sri Lanka, Tools genetic conservation of Animal Genetic Resources, Research and Policy issues pertaining to Animal Genetic Resources.</p>
AS 51108 - Bioclimatology	<p>Introduction to bio-climatology, Basic principles of bio-climatology; Important macro and micro climatic factors on livestock performance, Animal organs which are important for thermo regulation; control of body temperature and temperature regulation, water economy of farm animals, Effect of direct and indirect climatic factors on livestock performance; stress and adaptation, Acclimatization, Specific bio-climatic effects on livestock performance, Effect of high temperature on the growth, production and re-production of livestock.</p>
AS 51209 - Animal Waste Handling and Management	<p>Types and properties of animal wastes, impact of animal waste on environmental pollution, need of proper management, waste as a resource, available methods/options for animal waste management such as animal manure, composting, biogas etc., alternative products from animal wastes.</p>

AS 51110 - Livestock Environmental Interaction	<p>Environment; Definition, Abiotic Natural Resources (soil, water, air) and Biotic Natural Resources (Flora, Fauna, Microbes) with their diversity (ecosystem, species & genetic) and their determinants (Rain Fall, Temperature, RH, Wind, Light and Edaphic Factors); definition & types of waste & pollutants in the environment their effects.</p> <p>Livestock: Definition, Interactions with natural resources; Production processes and waste generation (Solid, effluent, air emissions, noise, odour), aquatic & non-aquatic ecosystems related to livestock, eutrophication</p> <p>Waste: Physical & Chemical properties, Analysis, Measurements, Management practices to minimize pollution, Monitoring of Environmental conditions, Reuse, recycling & Repairing.</p> <p>Environment Process Technology: Definition, Water and Wastewater Treatment, Mass balance analysis, Macro & Micro systems/ reactors, Aerobic & anaerobic processes, Microbes in waste treatment, sludge handling, Cleaner production/end pipe solution, Nano-technology</p> <p>Environmental Concerns & Legal Framework; Development and use of natural resources; “our common future” edition and sustainable development concept; International Environmental Concerns and treaties and Agencies of UN (Earth Summit, Water sharing, Kyoto Protocol, Carbon depletion), effect of El-Nino and Greenhouse gases; national Environmental Act, EIA/IEE & EPL processes.</p>
AS 52201 - Statistical Designs for Animal Experimentation	<p>Objectives of an experiment, Types of experiments, Experimental error, Replication and its functions, Choice of size and shape of the experimental units, Precision of an experiment, Increasing the scope of inference, Factors affecting the number of replicates, Error control, Use of concomitant observations, Randomization, CRD, RCBD, Latin Square Designs and Factorial Experiments, Linear additive model, Missing data analysis.</p>
AS 52202 - Animal Product Technology	<p>General Introduction, Importance of processing and preservation of animal derived products especially meat, milk and eggs. Structure and composition, handling, primary processing, further processing, preservation and value addition, biochemical changes occurring, packaging, quality</p>

	control and quality assurance, regulatory standards, nutritional value and food security related aspects, plant design and layouts essentials, byproduct utilization for sustainability, non-food animal product.
AS 52203 - Aquaculture	Fish culture and management, Fish Feeds and Nutrition, Genetics and fish breeding, Diseases and health management, Ornamental fish farming, Shrimp and bivalve culture, Sea cucumber farming, Sea weed culture, Aquatic pollution, Conservation & management of Aquatic Resources, Aquaculture and Integrated agriculture, Aquaculture based bio active substances and their industrial applications.
AS 52104 - Seminar	Each student has to do a seminar on a current topic related to Animal Science. Students should consult the teacher concerned before choosing a topic and should do a PowerPoint presentation of approximately 30 min duration. A seminar report should be submitted after the presentation.
AS 52505 - Directed Study	Each student has to carry out an independent learning exercise guided by a supervisor to conduct a research project or a case study or developing a product. The student should submit the Directed Study project report (5 credits) to the supervisor as per the instructions of the Board of Study of Agriculture. Students should follow the guidelines specified by the Board of Study of Agriculture.
AS 52106 - Metabolic Diseases and Therapeutic Nutrition of Ruminants	Introduction, Effect of stressful conditions and diseases on nutrient intake and metabolism ; Stressful conditions- Heat, Cold, Transportation, Starvation, Dehydration and Psychological conditions, Effect on food intake, nutrient absorption and excretion, Effect on rumen function, Interference with tissue storage and utilization of nutrients, Acid-base balance aspects. Prevention and therapeutic nutrition in stress and diseases; Visual appraisal for evaluating stress and nutrition related diseases, Diseases related to gastro-intestinal tract, Rumen malfunction – Bloat, Acute indigestion, Miscellaneous conditions and abnormalities; Antinutrients and toxicants – Urea/ammonia, Nitrates, Antivitamins, Goitrogens, Oxalate, Anthelmintics, Mineral toxicities, Herbicides and Pesticides, Common metabolic derangements – Ketosis, Parturient paresis (milk fever), Pregnancy toxemia, Grass tetany and Urinary calculi.

AS 52107 - Industrial and Field Visits	Students are required to participate in industrial visits organized by the relevant course instructor. Following the visit, each student must submit a report on a topic related to the place of visit, as assigned by the instructor.
AS 52108 - Animal Welfare and Legislations	Scientific background of animal welfare, Animal welfare norms and regulations, Animal experimentation and welfare, legislation and implementation.
AS 52209 - Livestock Economics	Basic economic principles and their application to livestock Production, Concepts of marketing of livestock products, Vertical & horizontal integration of different sub sectors of crop – Livestock systems, Farm planning, whole farm budgeting evolution of livestock sector in different regimes, Ancient crop – livestock systems & their impact on recent major Irrigation & settlement schemes on livestock sector in Sri Lanka, Comparative studies on crops, dairies and integrated farms.