

BANGLADESH TECHNICAL EDUCATION BOARD

SYLLABUS AND CURRICULUM

FOR

CERTIFICATE IN ANIMAL HEALTH AND PRODUCTION

TOTAL DURATION: 1(one) YEAR, 2 SEMESTER

CURRICULUM FOR CERTIFICATE IN ANIMAL HEALTH & PRODUCTION

1st semester
(Duration 6 month)

Sl. No.	Subject code	Name of subject	MARKS							
						Theory		Practical		Total
			T	P	C	Cont. assess	Final Exam.	Cont. assess	Final Exam.	
1.	2011	Anatomy	2	6	4	50	50	60	40	200
2.	2012	Physiology	2	6	4	50	50	60	40	200
3.	2013	Ruminant Animal Production	2	6	4	50	50	60	40	200
4.	2014	Animal Reproduction(AI)	2	6	4	50	50	60	40	200
5.	2015	Pathology and Parasitology	2	6	4	50	50	60	40	200
Total			10	30	20	250	250	300	200	1000

2nd semester
(Duration 6 month + 2 month)

Sl. No.	Subject code	Name of subject	MARKS							
						Theory		Practical		Total
			T	P	C	Cont. assess	Final Exam.	Cont. assess	Final Exam.	
1.	2021	Introductory Pharmacology	2	6	4	50	50	60	40	200
2.	2022	Non ruminant Production	2	6	4	50	50	60	40	200
3.	2023	Livestock Business	2	6	4	50	50	60	40	200
4.	2024	Animal Microbiology and Diseases	2	6	4	50	50	60	40	200
5.	2025	Rural livestock entrepreneurship	2	3	3	50	50	30	20	150
	2026	Internship (2 months)	0	6	2	-	-	60	40	100
Total			10	33	21	250	250	330	220	1050

Curriculum for Certificate in Animal Health & Production

Ist semester (Duration 6 month)

Subject: Anatomy

Code:

Credit-2(T)+2(P) = 4

Total class: 32

Chapter	Name of the Topics	Hours × class
1	Introduction of anatomy and descriptive terms	1×2=2
2	The structure of skeleton, development and growth, composition and physical properties of bones	1×4=4
3	Classification of bones and the descriptive of axial, appendicular and splanchnic skeleton	1×4=4
4	Definition and purposes of joints, classification, meaning and examples of various features of a typical joint.	1×4=4
5	Anatomy of digestive, respiratory and uro-genital system	1×6=6
6	Anatomy of the organs of circulation, the blood vascular and the lymphatic system	1×4=4
7	Study of the lymphatic organs	1×2=2
8	Study of the different glands	1×2=2
9	Anatomy of nervous system	1×2=2
10	Common sense organs and integument	1×2=2
Total class		32

PRACTICAL: Anatomy (32 classes)

Exp no.	Name of the Experiments	Hours × class
1	Identification of the morphological features of the skeleton	1×2=2
2	Identification of the morphological features of the joints	1×2=2
3	Dissection of domestic animals as per theoretical assignments	1×2=2
4	Identification of the morphological features of the mentioned body system	1×2=2
5	Dissection of the above body system in cattle and differential points with cattle, buffalo, sheep, goat and chicken	1×4=4
6	Comparative study of the various organs of the different system of domestic animals with special emphasis on cattle, buffalo, sheep, goat and chicken	1×4=4
7	Identification of different parts of brains and spinal cord, cranial and spinal nerve roots and tracing the courses of all cranial and spinal nerves to their target organs and autonomic nerves in details	1×4=4
8	The comparative anatomical studies of the bones, joints and ligaments and the organs of the digestive, circulatory, respiratory, urinary and reproductive system including appendages of cattle, Buffalo, Sheep and Goat	1×4=4
9	Anatomical features in relation to clinical, surgical, radiography and other applied purposes of different regions in domestic animals and fowls	1×4=4
10	Demonstration & dissection of domestic ruminants, non-ruminants and fowl to demonstrate the structures body regions involved in surgical manipulations, radiography and diagnostic clinical examination	1×4=4
Total class		32

Chapter	Name of the Topics	Hours × class
1	General physiology: Definition, cell concept, organization and function of the cell	1×2=2
2	Physiological properties, cellular and chemical constituent of blood, blood cells, plasma and serum.	1×4=4
3	The red blood cells(production, regulation, polycythemia and fate of red blood cells etc)	1×4=4
4	Plates, anticoagulants, blood coagulation and homeostasis	1×4=4
5	The body fluids(extra-cellular and intracellular fluid, body fluid determination, total body fluid), lymph	1×2=2
6	Structure of urinary system, kidney, nephron,	1×2=2
7	Respiratory apparatus, types and phases of respiration, mechanism of respiration	1×3=3
8	Digestion and absorption of protein, carbohydrate and lipid	1×2=2
9	Absorption of electrolytes, vitamins, minerals and water	1×3=3
10	Structure of the male genital organs, structure of the female genital system	1×2=2
11	Vitamins and minerals: definition & classification of vitamins and minerals, source, physiological functions, deficiency symptoms of vitamins and minerals, hypo and hypervitaminosis. Toxic elements	1×4=4
	Total class	32

PRACTICAL: Physiology (32 classes)

Exp No.	Name of the Experiments	Hours × class
1	Methods of collection and preservation of blood from various species of animal	1×2=2
2	Study of anticoagulants	1×2=2
3	Determination of coagulation and bleeding time	1×2=2
4	Separation of plasma, serum and defibrinated blood	1×2=2
5	Blood grouping	1×2=2
6	Measurements of blood pressure	1×2=2
7	Demonstration of capillary blood flow	1×2=2
8	Physiological constituents of urine and urine analysis	1×2=2
9	Collection of urine, Chemical examination of urine	1×2=2
10	Experiments of energy metabolism.	1×2=2
11	Recording of temperature, light, humidity, rainfall and velocity of wind	1×2=2
12	Study of normal physiology of reproductive organs	1×2=2
13	Hormonal analysis from biological fluids	1×2=2
14	Pregnancy diagnosis	1×1=1
15	Collection and evaluation of semen, synchronization of estrous, super ovulation, embryo transfer, in-vitro fertilization, preservation and cryopreservation of gametes and embryos.	1×3=3
16	Measures and measurements of growth of animals	1×2=2
	Total class	32

Subject: Ruminant animal
production

Code:

Credit-2(T)+2(P)=4

Total class: 32

Cha pter	Name of the Topics	Hours × class
1	Introduction: Common terminology used in livestock management, Livestock statistics, Conformation points of large and small ruminants (Cattle, Buffalo, Sheep and Goats)	1×2=2
2	Breed definition - Classification of ruminant livestock breeds, Systems of Breeding, National breeding policies ,Breeds of Dairy cattle, Buffaloes, Sheep and Goats, Identification of Bangladesh and exotic breeds and their productivity	1×4=4
3	Selection and Breeding of ruminant livestock, Selection and Culling of Cattle, Buffaloes, Sheep and Goats	1×3=3
4	Housing: Selection of site for livestock farms, Housing Systems for different age groups of livestock, Layout, Space, water, ventilation and light requirements, Hygiene and Sanitation: Hygiene and Sanitation in animal houses - Cleaning and fumigation of stores	1×6=6
5	Feeding of ruminants: Feeding definition - Common feeds and fodders, Formulation of rations, Feeding of different age groups, Quality control of feeds - Collection and Processing of samples for feed analysis, Urea treatment of paddy-straw and use of UMMB, Cultivation practices of Leguminous and Non-leguminous fodders, Fodder conservation- Hay preparation and Silage making	1×4=4
6	Quality control and Marketing of Dairy products and live animals: Procurement, Pricing policy, Transport, Storage and Distribution of milk, Detection of Adulterants and preservatives in milk, Common platform tests	1×4=4
7	Activities in livestock farms: Castration, Docking, Disbudding, Hoof trimming of livestock, Daily farm routine of livestock farms, Restraint of livestock, Shearing, Clipping, Dipping, Spraying and Deworming of livestock, Casting of livestock – methods, Care and management of different age groups of livestock, Weaning of ruminant animals	1×4=4
8	Marketing of Animal products, Economics of Livestock farming (Cattle and Buffaloes), Sheep and Goat farms	1×3=3
9	Livestock farm recordings	1×2=2
	Total class	32

PRACTICALS: (Ruminant Animal production) 32 classes

Exp No.	Name of the Experiment	Hours ×class
1	Familiarization with Conformation points of Cattle, Buffalo, Sheep and Goat	1×2=2
2	Identification of local and Exotic breeds of Cattle, Buffalo, Sheep and Goat	1×1=1
3	Approach and Handling of Cattle, Buffaloes, Sheep and Goats	1×2=2
4	Methods of Restraint of ruminants, Methods of Casting of livestock	1×2=2

5	Housing Systems and lay out for different age groups of Cattle and Buffaloes	1×1=1
6	Housing and lay out for different age groups of Sheep and Goats, Floor Space requirement for different age group of animals	1×1=1
7	Selection of Cattle, Buffaloes, Sheep and Goats by Score card methods	1×1=1
8	Culling of ruminant livestock	1×1=1
9	Identification of important feeds and fodders, ,	1×2=2
10	Formulation of rations for Cattle, Buffaloes, Sheep and Goats	1×2=2
11	Demonstration of Hay preparation, Demonstration of Silage making And Urea treatment of paddy straw	1×2=2
12	Collection and processing of samples for feed analysis	1×2=2
13	Castration, Docking, Disbudding, Hoof trimming of livestock and Shearing and Clipping, Dipping and Spraying	1×2=2
14	Care and management of new born animals, growing animals and Pregnant animals, Care and management of breeding males	1×2=2
15	Care and management of milk animals, Methods of milking	1×2=2
16	Common platform tests, Detection of adulterants and Preservatives	1×2=2
17	Visit to Dairy farms- Demonstration of various management practices	1×2=2
18	Visit to Sheep and Goats farms - Demonstration of various management practices	1×2=2
	Total class	32

Subject: Animal Reproduction **Code:** **Credit-2(T)+2(P)= 4** **Total class: 32**

Chapter	Name of the Topics	Hours × class
1	Introduction: concept of genetics, history of genetics, branches of genetics, application of genetics in livestock improvement and human welfare	1×2=2
2	Sex related inheritance: Sex determination: sex-linked, sex-influenced limited traits in farm animals;	1×2=2
3	Immunogenetics :Immune response, antibody diversity, genetic resistance to diseases ,multiple alleles, blood groups and plasma protein polymorphism in animals and human .	1×2=2
4	Concept of animal breeding, its development and application. development of breed association	1×2=2
5	Breeding systems: Inbreeding & outbreeding: definition, Co-efficient and consequence of inbreeding, Classification and application of out breeding, heterosis	1×2=2
6	Animal Recording: Reasons for benefits and beneficiaries, guidelines for animal recording system in the tropics,	1×2=2
7	Poultry breeding, origin and domestication, evolution, diversity and conservation of poultry genetic resources. Poultry genetic resources: species, breed, strains, lines and families.	1×2=2
8	Selection for egg production: number of eggs laid; rate of lay, persistency of production , age and weight at sexual maturity , feed conversion efficiency, egg size and egg quality.	1×2=2

9	Breeding for meat production: Development of lines and strains for meat (broiler) production.	1×2=2
10	Breeding for egg production: pure breeding, strain crossing, breeding for general and specific combining abilities.	1×2=2
11	Industrial breeding: nucleus breeding systems (NBS), development of corporation and large scale poultry breeding pregame.	1×2=2
12	Female Reproduction: Estrus cycle in livestock, Signs of heat, Detection of heat, Gestation, Gestation period in livestock Parturition, Stages of parturition, Anoestrus, Dystocia Retained Placenta, Pyometra, Infertility – Causes and prevention, Synchronization of heat	1×4=5
13	Artificial Insemination and Frozen semen Technology: Equipment required in AI, Semen collection, processing and evaluation Preservation of frozen semen, Insemination Techniques Precautions for successful AI, Liquid Nitrogen containers	1×5=5
Total class		32

PRACTICAL: 32 classes (Animal Reproduction)

Exp No.	Name of the Experiment	Hours
1	Methods and materials for genetic studies.	1×2=2
2	Study on day old chick sexing.	1×2=2
3	Computation of gene and genotype frequencies.	1×2=2
4	Analysis of breeding records of different livestock and farms and their maintenance,	1×2=2
5	Milk recording	1×2=2
6	Study of pedigree and history sheets	1×2=2
7	Management of breeding animals.	1×2=2
8	Problems related to selection experiment.	1×2=2
9	Study of male reproductive system	1×2=2
10	Study of female reproductive system.	1×2=2
11	Solving problems on poultry breeding.	1×2=2
12	Collection, selection and preservation of breeding eggs	1×2=2
13	Auto sexing.	1×2=2
14	Record keeping and evaluation of poultry for meat and egg production.	1×2=2
15	Visit to a breeding farm	1×4=4
Total class		32

Subject: Pathology and parasitology **Code:** **Credit-2(T)+2(P)= 4** **Total class: 32**

Chapter	Name of the Topics	Hours ×class
1	Definition, branches and scope of pathology, cell injury and cell death: causes of cell injury and death,	1×2=2
2	Characteristics of necrotic cells and tissues;	1×2=2
3	Disturbances of growth: aplasia, hypoplasia, atrophy, hypertrophy, hyperplasia, metaplasia, anaplasia, dysplasia and neoplasia	1×2=2

4	Immune response effector mechanisms; hypersensitivity; autoimmunity; immunodeficiency	1×2=2
5	Nutritional and metabolic disease: deficiencies of fat soluble and water soluble vitamins, deficiencies of calcium, phosphorous, iron copper, zinc, iodine, deficiency of protein; ketosis, milk-fever, grass tetany, rickets, osteomalacia,	1×4=4
6	Classification of extraneous poisons on the basis of pathologic features; pathology of snake venoms, arsenic ,urea, oleander, copper, carbon, tetrachloride, gossol,vetch,sulfonamide and selenium, dicoumarin, bracken fern, nitrate, lathyrus, coffee, senna, coyotillo	1×3=3
7	Pathogenesis and pathology of the following diseases: Bacterial diseases:Anthrax, Black Quarter, pasteurellosis, clostridial infections, Colibacillosis Brucellosis, Tuberculosis Leptospirosis, dermatophilosis, leprosy etc	1×2=2
8	Viral diseases: Rinder pest, Pestis petitis de ruminants (PPR), Foot and Mouth disease, Rabies, pseudorabies, infectious canine hepatitis, Pox diseases: Buffalo pox, cow pox, sheep pox, goat pox, fowl pox and prion diseases	1×3=3
9	Parasitic diseases: fascioliasis, stomach worm infection, hookworm infection, stephanofilariasis, ascariasis, coccidiosis, Tapeworm infections, mites infections	1×2=2
10	Introduction to parasitology, host-parasite relationship and adaptation of parasites	1×2=2
11	Morphology of helminthes, geographical distribution and transmission of parasites	1×2=2
12	Definition and life cycle and developmental stages of helminthes	1×2=2
13	Parasitic immunity, immunity against parasites, parasitic infection, control and treatments	1×2=2
14	Post mortem examination of animal and birds for parasites	1×2=2
	Total class	32

Practical: Pathology and parasitology (32 classes)

Exp No.	Name of the Experiment	Hours × class
1	Methods collection, preservation, fixation, processing and staining of pathological specimens	1×2=2
2	Study of basic alterations of cells and tissues using laboratory specimens,	1×1=1
3	Histo-pathological slides, illustrations and transparencies	1×2=2
4	Study of histopathological slides by ordinary projection microscope and slides	1×1=1
5	On farm investigation, laboratory investigation, post mortem examination and their interpretations	1×1=1
6	Study of various diseases using laboratory specimens, histopathological slides, illustration and transparencies	1×2=2
7	Setting up a clinical pathology laboratory, cleaning and maintenance of glassware and instruments in clinical pathology laboratory	1×2=2
8	Preparation of various buffers, stains and reagents	1×1=1
9	Methods of sample collection, culture, common staining and antibiotic sensitivity tests.	1×2=2

10	ELISA, agar gel precipitation test heamagglutination and heamagglutination inhibition tests	1×2=2
11	Methods of clinical report writing	1×1=1
12	Techniques of postmortem examination of animal and poultry, interpretations of post mortem findings, selection, collection, preservation and shipment of pathological specimens to the diagnosis of specific disease and disease conditions.	1×3=3
13	Fecal sample examination: qualitative and quantitative methods, identification of cercariae, identification of metacestodes, collection of helminthes from visceral organs of ruminants and their preservation	1×3=3
14	Collection of helminthes from visceral organs of poultry and their preservation	1×1=1
15	Study of parasitic egg and larvae by feces, urine, nasal discharge and blood examination through different techniques	1×2=2
16	Detection of nematode larvae from field sample (grass, herbage, etc) by using Baermann's apparatus.	1×1=1
17	Microscope measurement of helminthes and their eggs	1×1=1
18	Protozoan parasites identification, collection, preservation and diagnosis	1×2=2
19	Study of the morphological characters of the protozoa of livestock and poultry in Bangladesh	1×1=1
20	Demonstration of the lesions produced by protozoa of livestock and poultry in Bangladesh	1×1=1
	Total class	32

Semester 2

Subject: Introductory Pharmacology **Code:** **Credit-2(T)+2(P)=4** **Total class: 32**

Chapter	Name of the Topics	Hours ×class
1	Definitions of pharmacology and its branches, scope of pharmacology	1×1=1
2	Drug standards, assay and regulation, drug dose forms, prescription writing, Metrology	1×4=4
3	Methods and routes of administration of drugs,	1×1=1
4	Factors altering drug response, drugs for gastro-intestinal tract's disorders (sialics and antissialics, demulcents, stomachics, emetics and antiemetics)	1×3=3
5	Drugs for cough and bronchial asthma (pharyngeal demulcents, expectorants, mucolytics, antitussive, antihistamines and bronchodilators)	1×3=3
6	Drugs acting on kidney, drugs altering the pH of the urine	1×1=1
7	Drugs acting on cardio-vascular system (heart tonic, stimulants and depressant), drug acting on blood and blood elements	1×2=2
8	Depressant (general depressant: sedative, hypnotics or soporifics, narcotics, analgesics or anodynes, tranquillizers, anaesthetics, sympatholytic and parasympatholytic drugs, ganglionic blocking drugs) stimulants (sympatholytic and parasympathomimetic drugs)	1×2=2
9	Chemotherapy: Definition and basic principles of chemotherapy, different chemotherapeutics	1×2=2
10	Antibiotics: Definition, classification with chemistry, Ideal features, sensitivity and the ways of resistance of antibiotics, dose, mode of action, residues in food animals, bacterial resistant, toxicity (acute and chronic)	1×3=3
11	Sulphonamides: commonly used Sulphonamides with dose, clinical uses and microbial susceptibility of Sulphonamides,	1×2=2
12	Herbal drugs: Identification, active principle/ ingredients, indication, contraindication and side effects of different important medicinal plants	1×2=2
13	Classification of drug affecting the endocrine system (hormones and related drugs) with their pharmacological effects	1×2=2
14	Supplementation of nutrients as drugs (vitamins, minerals and trace elements)	1×2=2
15	Study of vaccines, sera and diagnostic agents	1×1=1
Total class		32

Practical: 32 classes (Introductory Pharmacology)

Exp no.	Name of the Experiments	Hours ×class
1	Identification of various instruments used in pharmacology laboratory	1×2=2
2	Identification, characterization and indications of some medicinal plants	1×2=2
3	Identification and indication of various forms of drugs and packaging drugs	1×2=2
4	Methods of administration of drugs	1×2=2
5	Metrology and prescription writing	1×4=4

6	Group discussion interpretation and presentation of drugs available related to different group in market	1×2=2
7	Preparation of solution (Iodine, Acriflavin and calcium borogluconate)lotion(boric acid lotion), ointments(iodine, sulphonamides and whitefield's), liniments (ABC), paste(BIPP), and powder(dusting), pills, tablets, caplet, bolus	1×4=4
8	Group discussion interpretation and presentation of antimicrobial drugs(Bacteria, virus and fungus)	1×4=4
9	Identification, characterization of common poisonous plants available in bangladesh	1×2=2
10	General diagnosis procedure for different poisoning cases	1×2=2
11	Laboratory diagnosis of poisons (cyanide, nitrate, arsenic and mycotoxin) etc	1×2=2
12	Drugs and chemical residues in the edible tissues of animals. Various agents causing environmental pollution	1×4=4
	Total class	32

Subject: Non - Ruminant Animal Production **Code:** **Credit-2(T)+2(P)= 4** **Total class: 32**

Cha pter	Name of the Topics	Hours ×class
1	Introduction – Conformation points and Common breed Characteristics of Poultry and rabbit	1×2=2
2	Common terminology used in poultry management, Identification and Classification of exotic breeds and their productivity	1×2=2
3	Housing Systems of Poultry and Rabbit(Layout, Space, water, ventilation and light requirements)	1×4=4
4	Selection, Breeding of poultry and rabbit of different age groups	1×2=2
5	Formulation of rations- Feeding of different age groups, Feed supplements and Additives for poultry	1×4=4
6	Selection and Culling, Litter management in poultry farms	1×2=2
7	Care and management of different age groups of poultry	1×2=2
8	Care and management of layers and broilers in poultry farms	1×2=2
9	Hatchery management	1×2=2
10	Hatching eggs – Collection, Selection, Storage and Fumigation	1×2=2
11	Activities of poultry and rabbit farms	1×2=2
12	Ante-mortem and Post-mortem examination of poultry and rabbit	1×2=2
13	Methods of slaughter of poultry and principle of meat preservation	1×2=2
14	Marketing system of poultry products	1×2=2
	Total class	32

PRACTICALS: 32 class (Non ruminant animal Production & Management)

Sl.No.	Name of the Experiment	Hours ×class
1	Conformation points of Poultry and rabbit	1×2=2
2	Identification and Classification of exotic breeds and their productivity	1×2=2

3	Preparation of poultry house; Housing Systems and lay out for different age groups of Poultry.	1×2=2
4	Floor Space requirement for different age group of Poultry	1×2=2
5	Preparation of rabbit house; Housing Systems and lay out for different age groups of rabbit	1×2=2
6	Floor Space requirement for different age group of rabbit	1×2=2
7	Practice of debeaking, routine works and sanitary measures	1×1=1
8	Formulation of rations for various Poultry species,	1×2=2
9	Feed supplements and Additives for Poultry,	1×2=2
10	Feed plant- feed mixing and machinery used for Poultry feed preparation	1×2=2
11	Identification of different vaccines and application of vaccines in Poultry	1×2=2
12	Poultry farm equipment, Sanitation and disinfections of poultry cages	1×2=2
13	Litter management in poultry farms	1×2=2
14	Incubators, Setters and Hatcher, Cleaning and disinfections,	1×2=2
15	Hatching of eggs, Collection, Selection, Storage and Fumigation	1×1=1
16	Ante-mortem and Post-mortem examination of Poultry (broiler, layer, quail, duck etc.)	1×2=2
17	Ante-mortem and Post-mortem examination of Rabbit	1×1=1
18	Methods of slaughter of Poultry and rabbit	1×1=1
	Total class	32

Subject: Animal Microbiology and Diseases **Code:** Credit-2(T)+2(P)= 4 **Total class:** 32

Chapter	Name of the Topics	Hours × class
1	Definition of health and disease, Signs of health	1×2=2
2	Definition of first aid and its principles, First aid kit, Attending to common emergencies	1×2=2
3	Definition: Hygiene, sanitation and bio-security, hygiene requirement in connection with breeding, feeding and transit of animal, hygiene measure for the prevention and control of infectious diseases, isolation, quarantine, disinfection, disinfestations and immunization	1×2=2
4	Implementation of bio-security measures for prevention of infectious diseases	1×2=2
5	Microbiology, dairy microbiology, bacteria, virus, fungi and other microorganisms. Mechanism of infection; toxin and antitoxin;	1×2=2
6	Micro-organisms of milk and dairy products; methods of controlling growth of micro-organisms;	1×2=2
7	Disinfectants and their characteristics	1×2=2
8	Vaccines and vaccination, production, evaluation, storage and transportation of vaccines, vaccination schedule	1×2=2
9	Classification of livestock diseases	
	Bacterial diseases: Anthrax, Black Quarter, pasteurellosis, clostridial infections, Brucellosis, Hemorrhagic septicaemia, Tetanus, Tuberculosis, Colibacillosis, Mastitis, Pneumonia TB, Brucellosis, Salmonellosis, Leptospirosis, infectious coryza, streptococcosis, staphylococcosis	1×2=2

	Viral diseases: Foot and Mouth disease, Rabies, Pox diseases: Buffalo pox, cow pox, sheep pox, goat pox, fowl pox, Ranikhet disease, IBD, IB, Pestis petitis de ruminants (PPR), Contagious Ecthyma, marek's disease, avian influenza	1×3=3
	Protozoan diseases: Coccidiosis Anaplasmosis, Babesiosis, Trypanosomiasis, Theileriasis, Leishmaniasis	1×2=2
	Ecto and endo parasitic diseases: Flies, Ticks and Mites, Round worms and Tape worms, Liver flukes, Stomach fluke sand Nasal schistosomiasis, Ring worms and Aspergilliosis, Milk fever, Ketosis Pregnancy, toxemia, Bloat, Acid indigestion Alkaline indigestion	1×2=2
	Zoonotic diseases: Bacterial zoonoses, Viral zoonoses, parasitic zoonoses, Calf scours, Calf septicaemia, Pneumonia, Ascariasis,	1×1=1
	Protozoan diseases: Amoebiasis, babesiosis, theleriosis, coccidiosis, trichomoniasis, trypanosomiasis and Ectoparasites: Ticks, mites, myiasis	1×2=2
10	Principles of Disease prevention control and eradication	1×2=2
11	Isolation of sick animals, Disinfections of premises Immediate treatment of sick animals and Quarantine,	1×2=2
	Total class	32

PRACTICALS: 32 classes (Animal Microbiology and Diseases)

Exp No.	Name of the Experiment	Hours × class
1	Determination of health by external appearance (signs)	1×1=1
2	Recording Body temperature, pulse and respiration and Identification of sick animals, Study of first aid kits	1×2=2
3	Cultivation, isolation and identification of bacteria and virus	1×2=2
4	Fundamental of molecular techniques- Polymearase Chain Reaction, Reverse Transcription Polymearase Chain Reaction(RTPCR), DNA extraction, Gel electrophoresis	1×4=4
5	Vaccination of cattle, goat, sheep and poultry	1×2=2
6	Collection and preservation of serum, tritration of antibodies in serum. Detection of haemagglutinating viruses	1×3=3
7	Serological tests: Agglutination, precipitation, haemagglutination inhibition, direct and indirect FAT, ELISA, Rapid antigen detection tests	1×4=4
8	Screening of animals for diseases –Mastitis, Tuberculosis	1×1=1
9	Collection and dispatch of materials in various diseases conditions	1×1=1
10	Examination of milk for detecting Mastitis – Strip cup test, CMT (California Mastitis test)	1×3=3
11	Attending to Veterinary Hospitals for observing and recording signs exhibited by animals in various disease conditions	1×2=2
12	Collection, preservation and dispatch of samples-Blood, Urine, Faeces and Vaginal discharges	1×2=2
13	Drugs dosage forms, Prescription reading , Routes of drug administration	1×2=2
14	Antihistaminic, common antibiotics, fungal agents and disinfectants	1×2=2
15	Anthelmintic, antiprotozoal and ecto-parasiticidal drugs	1×1=1
	Total class	32

Chapter	Name of the topics	Hours × class
1	Livestock production economics: Definition of economics, concept of micro and macro economics, role and importance of economics in the livestock production, livestock goods, wealth, wants	1×1=1
2	Producer surplus, consumer's surplus and social benefit	1×1=1
3	Theory of Utility: definition, classification utility and marginal utility analysis, consumers equilibrium in respect of income, price and substitution effects	1×2=2
4	Indifference curve: definition characteristics of indifference curve, marginal rate of substitution(MRS), budget line and consumers equilibrium, changes in consumer's equilibrium in respect of income, price and substitution effects	1×2=2
5	Demand, supply and elasticity: Meaning of demand, factors influencing demand function, law of demand, demand curve, slope of demand curve, why does the demand curve slope downwards to the right, exception to the law of demand, Increase and decrease of demand, causes of changes of demand, meaning of supply, factors influencing supply, supply function, supply curve, equilibrium of demand supply with illustrations. Elasticity of demand and supply, types of elasticity, measurement of elasticity	1×2=2
6	Production and production function: Meaning of production, brief ideas of factors of production, definition, efficiency of labor, Malthusian theory of population, concept of production function, law of diminishing return or 3 stages of production, at which stages production is justified? Concept of Iso-production curve and marginal rate of technical substitution (MRTS) and Iso-cost line	1×2=2
7	Cost and revenue: concept of the cost of production, money cost, real cost, opportunity cost, fixed cost, variable cost, total cost, average cost, marginal cost, different cost curves in diagram relationship between AC & MC, concept of total, average and marginal revenue and relationship between average and marginal revenue under perfect and imperfect competition	1×2=2
8	Market: Meaning of market, condition of wide market, classifications of market on the basis of area, time period and nature of competition, equilibrium of as soon as possible firm under perfect competition(Short run and long run), concept of price discrimination	1×2=2
9	Money and banking: Concept of money, definition of bank, types of bank, concept and function of commercial and specialized bank in Bangladesh,	1×2=2
10	National income: Meaning of national income, concept of national income, methods of measurement of national income, measurement of national income in Bangladesh.	1×2=2
11	International trade: meaning and classical theory of international trade and gains from international trade in Bangladesh, WTO, tax, LC, freight C&F and MOU etc	1×2=2

12	Project: Definition of project, project analysis tools, data requirements, procedure of project analysis, simple rate of return(SRR), pay back period, net present value(NVP), cost benefit ratio(BCR), Internal rate of return (IRR) and their advantage and disadvantages	1×2=2
13	Livestock marketing: definition, scope, role and importance of marketing, agricultural marketing as well as livestock marketing, market vs marketing vs selling, explain- marketing is complex and costly, marketing is productive	1×2=2
14	Marketing function: definition, classification and discussion, relation between standardization and grading, basic concepts of milk market, buying and assembling of milk, milk processing, standardization, grading and sampling of milk difficulties of grading farm products in Bangladesh	1×2=2
15	Marketing cost and efficiency: definition of marketing cost, elements of marketing cost, conditions, affecting marketing cost, how to reduce marketing cost, definition of marketing efficiency, categories of marketing efficiency, how to improve marketing efficiency	1×2=2
16	Marketing margin and price spreads: Definition, net margin, total margin of price spreads, farmer's share in retail price and farmer's net share	1×2=2
17	Marketing channel and intermediaries: Marketing channel and intermediaries, classification of middleman, wholesaler, retailer, function of retailer, wholesaler Vs retailer,	1×2=2
	Total class	32

PRACTICAL: 32 Classes (Livestock Business)

Exp No.	Name of the Experiment	Hours × class
1	Sampling	1×2=2
2	Enterprise costing	1×2=2
3	Gross margin analysis	1×2=2
4	Calculation of depreciation	1×2=2
5	Agricultural project analysis	1×3=3
6	Farm survey and report writing	1×2=2
7	Marketing system as well as marketing channels of livestock and their products i.e. cattle, beef, and beef products, poultry (day old chick, broiler, layer and duck) and poultry meat, egg, milk, hides and skin, etc	1×6=6
8	Calculation of marketing margin.	1×2=2
9	Test of market integration	1×2=2
10	Basic information about Aftab, paragon, Kazi, C. P. Bangladesh ltd. Milk vita etc	1×5=5
11	Field visit to poultry farm, dairy farm and feed industry to know the marketing system of livestock product, finally report writing and group presentation	1×4=4
	Total class	32

Chapter	Name of the topics	Hours × class
1	ECONOMICS OF LIVESTOCK FARM	1×4=4
	Economics of dairy farming / poultry farming	1×1=1
	Project reports for small sized livestock farm	1×1=1
	Role of poultry and dairy cooperatives	1×1=1
	Livestock developments programs for rural farmers	1×1=1
2	LIVESTOCK BUSINESS	1×5=5
	Prerequisites for the establishment of farm enterprise, Potentialities, Prospects, Production system, Determination of the size of the enterprise and its expansion potential	1×2=2
	Selection of place and construction details- designs	1×1=1
	Economic analysis, Financing sources	1×1=1
	Relevant legislation and procedures for the issue of the necessary licenses	1×1=1
3	MANAGEMENT OF FARM ENTERPRISES:	1×7=7
	Organizational structure of the enterprise, Framework of the enterprise , Enterprise management	1×1=1
	Division of accounting, Production system developments, Organization of the enterprises of the livestock production,	1×2=2
	Organization and production factors within staff	1×1=1
	Business planning – budget, Profitability analysis	1×1=1
	Principal and rules of managements, Modern management	1×1=1
	Inventory of enterprise, Balance sheet, Changes in the elements of the enterprise financial position and their control, Account book,	1×1=1
4	AGRICULTURAL ECONOMICS: Agricultural economics elements, Division of agricultural property, Technical data analysis, Analysis of forms of invested capital, Technical and economic indicators, Costing of agricultural products, Analysis of economic results, cobweb model	1×3=3
5	PRODUCT MARKETING: Marketing system of livestock products (beef cattle, meat, milk, egg, and poultry-broiler, chicks etc.) marketing. Marketing system of livestock bi-products (hides and skins, skim and powdered milk etc). Slaughtering Procedures, Meat cuts & Products, Poultry products Packaging, Preservation and Transportation, marketing of vaccine, medicine, equipments feed and feed additives.	1×2=2
6	COOPERATIVE MARKETING: Concept of cooperative marketing, activities, functions and performance of some cooperative milk producers such as (milk vita), Savar dairy farm, BRAC , Aftab Bohumukhi farm ltd. etc. causes of failure of cooperative marketing society, prerequisites for the success of cooperative marketing, Cooperative livestock breeding	1×4=4
7	PRICING OF AGRICULTURAL PRODUCTS: Peculiarities of agricultural products, determination of market price of perishable commodities, price determination under monopoly and duopoly	1×2=2

8	ADVERTISEMENT: definition role of advertisement in modern society, advertisement media, types of marketing cost of advertisement, is advertisement wistful is advertisement profitable or does advertisement pay?	1×1=1
9	Farm record keeping: Importance of record keeping, types of records, Eggs production records, Feed issue records, Stock & mortality record, Sale record (egg & meat), Health record, Overall record maintenance, Record keeping system in hatchery, Record keeping system for breeding stock.	1×2=2
10	MARKETING PROBLEMS: Identify the problems and prospects of livestock and livestock products marketing in Bangladesh.	1×2=2
Total class		32

PRACTICAL: 16 classes (Rural livestock entrepreneurship)

Exp No.	Name of the Experiment	Hours × Class
1	Survey of feed market	1×1=1
2	Marketing cost analysis	1×1=1
3	Field trip to commercial feed marketing	1×1=1
4	Analysis of BCR in different poultry, dairy and livestock project	1×2=2
5	Farm survey and report writing	1×1=1
6	Study of cooperative marketing system in Bangladesh	1×1=1
7	Advertisement procedure in livestock product	1×1=1
8	Farm budgeting system and production cost	1×1=1
9	Cost benefit analysis for meat and egg production	1×1=1
10	Field visit to poultry farm, dairy farm to know the cooperative marketing system of livestock product finally report writing and group presentation	1×2=2
11	Preparation of record keeping sheet for layer and broilers production	1×1=1
12	Preparation of record keeping sheet for vaccination and medication	1×1=1
13	Preparation of record for breeding stock management	1×1=1
14	Preparation of record for hatchery management	1×1=1
Total class		16

LIST OF EQUIPMENT FOR ANIMAL HEALTH

a. Equipments

1	Haemocytometers	1	31	Buckets iron	5
2	Mono cular Microscopes	2	32	Plastic mugs	12
3	Dryer/ Oven	2	33	Hand washing dish with stand	12
4	Castrator Small animals	3	34	Chemical balance with weights	2
5	Castrator Large animals	1	35	Autoclave vertical (electrically operated) 30 litres capacity	1
6	Wire saw with handles	5	36	Micro pipettes fixed & Adjustable volume 500 micro litres	3
7	Artery forceps 8& 12 inches	5	37	Bacteriological incubators	1
8	Curved blunt edge scissors 12 inches	5	38	Trevis	2
9	Straight blunt edge Scissors 12 inches	5	39	Refrigerator	2
10	Straight sharp edge scissors 12 inches	5	40	Water distillation apparatus	1
11	Curved sharp edge scissors 12 inches	5	41	Sediment testing equipment	1
12	Thumb forceps 12 inches	3	42	Butter churn	1
13	Rat toothed forceps 12 inches	3	43	Cream separators	1
14	Needle holding forceps	5	44	First aid kit	5
15	Bone cutter	1	45	Poultry brooding equipment/ gas brooder /Electric brooder/ carosine brooder	5
16	Stainless steal Hammer (1-2 pounds weight)	3	46	Automatic poultry vaccination syringe	5
17	Stainless steal chisel	2	47	Dren29 Surgical apron green	5
18	Vaginal speculum cattle	1	48	Stomach tube	5
19	19 Vaginal speculum sheep	1	49	Mouth gag	5
20	Trocar & canula stainless steel (S.s.) sheep and cattle	1	50	Plastic tray 30X20CM	10
21	Surgical instrument sterilizing drums 2	1	51	Small animal Examination table	1
22	A.I. Gun 0.5ml &0.25ml size	10	52	Surgical table	1
23	Liquid Nitrogen container 10 litters	2	53	Surgical suturing needles curved traumatic & a traumatic	1
24	A.I. sheaths (100 no. packs)	10	54	compound microscope	1
25	Disposable Gloves Full hand size Vety. Gynaecology use	100	55	Gerbers centrifuge	1
26	Gum shoos No 10 size	10	56	Digital Ph meter	2
27	Gynaecology aprons	10	57	Chemical balance with weights	1
28	Doctors white aprons	5	58	Autoclave vertical (Electrically operated) 30 liters capacity	1
29	Surgical apron green	5	59	Micro pipettes fixed & adjustable volume 500 micro liters	5
30	Casting rope cotton	2	60	Bacteriological incubators	1

B. GLASSWARE

1	Measuring cylinders Nylon 0.5lt, 1lt	5+5+5	25	2 Beakers 250ml, 500ml,1000ml	5+5+5
2	Reagent bottles	5+5	26	4 Petri dishes Big , Small	5+5
3	Watch glass	1	27	Test tubes with rim 10cmX125mm	10
4	Test tubes with rim 10cmX125mm	10	28	Test tubes with rim 10cmX125mm	10
5	Test tubes rimless 10cmX125mm	10	29	Test tubes rimless 10cmX125mm	10
6	Test tubes rimless 10cmX125mm	10	30	Glass slides	10
7	Cover slips	10	31	Flat bottom flask Big	2
8	Flat bottom flask small	2	32	Round bottom flask Big	2
9	Round bottom flask small	2	33	Pipettes volumetric 5ml,15ml , 20ml	3+3+3
10	Pipettes serological 1ml,2ml,3ml, 5ml,	3+3+3+3	34	Glass Rod	10
11	Volumetric flasks 50ml,100ml, 250ml, 500ml	3+3+3+3	35	Funnel glass	5
12	Burette 50ml& 100ml	5+5	36	Separating funnel	5+5
13	Kjeldol flasks	1 set	37	Gerbers pipette (10.75 ml)	5
14	Centrifuge test tube nylon plane (Tarsons)	5	38	Centrifuge test tube nylon graduated (Tarsons)	5
15	Test tube stands different size	1	39	Conical flasks 50ml, 100ml, 250ml, 500ml	5+5+5+5
16	Motor and pestle	1	40	Filter papers No.40 &No.41	100
17	Ointment Plates (Ceramic)	5	41	Spatula	1
18	Spirit lamp	5	42	LPG gas Cylinder connection with stove	1
19	Bunsen Burners	5	43	Tripod stand with mesh	5
20	Test tube brushes Nylon	5	44	Lactometer	10
21	Urine meter	2	45	ESR tubes (western green pipettes)	3
22	Hb meter pipettes	3	46	RBC pipette with connecting tubes	3
23	WBC pipette with connecting tubes	3	47	Inoculation loops	2
24	Rubber bulbs different size	3+3+3			

C. CHEMICALS

1	Gentian violet 125 ml	2	Giemsa Stain 125 ml
3	Methyl Violet 125 ml	4	Methyl Orange 125 ml
5	Eosine	6	Methylene blue
7	Carbol fuschine	8	Lactophenol cotton blue 500ml
9	Phenophthalene 125ml	10	Newmans Stian 100ml
11	Grams Iodine 100ml	12	12 Methyl red 125ml
13	Hamatoxiline stain 100ml	14	Crystal violet 125ml
15	Leishman stain solution 250ml	16	Sudan III 25gm
17	Basic Fuschin 125ml	18	Agarose 10 gm
19	PH indicator paper all ranges	20	Labolene solution 5Lt.
21	Methanol	22	Nitric acid
23	Pottasium Iodide	24	Sodium chloride
25	Sodium hydroxide	26	Disodium hydrogen orthophosphate
27	Sodium hydrogen phosphate	28	Potassium dihydrogen orthophosphate
29	Potassium permanganate	30	WBC Diluting fluid
31	Sulphuric acid 500ml	32	Benedicts solution
33	Sulphur 500gm	34	Ammonium hydroxide
35	Sodium Sulphate	36	Mercuric chloride
37	Sodium nitro pruside	38	Tri chloro acitic acid
39	Potasium oxalate	40	Sodium citrate
41	Sodium bicarbonate	42	Calcium chloride
43	Spirit	44	Magnesium sulphate
45	Zinc sulphate	46	Potassium dichromate
47	Potassium chloride	48	Potassium iodide
49	Total hardness tablets	50	Sodium nitrate

51	Oxalic acid	52	Sodium carbonate
53	Phenol	54	Acetone
55	Boric acid powder	56	Oil of cedar wood
57	Amyl alcohol	58	Hydrogen peroxide
59	Sodium Nitrite	60	Sodium sulphite
61	Glycerol	62	

N.B. MINIMUM ONE OR TWO (1 OR 2) BOTTLE /LITER/KG FOR EACH ITEM INITIALLY NEEDS.

REFERENCE BOOKS

1. Livestock management

Name of the books	Author / publisher
Livestock Production and Management	NSR Sastry, AK Thomas and RA Singh
Handbook of Animal Husbandry	ICAR
Text book Animal Husbandry	G.C.Benarjee
Veterinary practitioners guide	Prof. Dr. M.A.Samad, LEP,BAU,Mymensingh
Animal Nutrition and feeding practices	S.K.Ranjan
Artificial Insemination of farm animals	Perri J Ed
Veterinary Medicine	DM Rodastits, DC Blood and CC Gay . 9 th Ed
Text book of Preventive Veterinary Medicine	Amalendu Chakrabarathi
Text book of Clinical Veterinary Medicine	Amalendu Chakrabarathi
Poshu Palon O Chikitsavidya	Prof. Dr. M.A. Samad, LEP,BAU,Mymensingh
Uchatar Poshubiggan	Prof. S.M.Imam Hosen
Clinical Diagnosis	W R Kelly
Practical Animal Science	Prof. DR. M. Mujaffar Hossain & Prof. DR. Shajeda Akter
Essentials of Veterinary Surgery	A.Venugopalan
Pharmacological basis of Therapeutics	Goodman and Gillman
Modern Pharmacology	CR Craig
Dukes' Physiology of Domestic animals	M J Swinson
The Anatomy of Domestic animals	Getty
Anatomy of Domestic animals	Sissons
Milk production & processing	C.I. Kutty, Deep & deep, 2004
Applied Physiology	Wright
Text book of Veterinary Physiology	Cunningham
Animal Parasitology	L D Smith
Veterinary Protozoology	Richardson
Parasites of Domestic animals	by Cameron
Medical Microbiology	Duguid I P.
Veterinary Bacteriology and Virology	Merchant IA
Microbiology	Lansing M P
Clinical Pathology	Ganti A Sastry
Laboratory Techniques	B. Prasul
Veterinary lab Manual	Bush
Meat Hygiene	Gracy

2. Poultry Science

Name of the books	Author / publisher
Poultry production	Austin RE and MC Neshiem lea & febiger ltd UK
Livestock and Poultry Production	Harbans Singh and E.N. Mooore
Poultry diseases, Diagnosis and Treatment	HVS Chauhan
Poultry Science and medicine	Prof. Dr. M.A. Samad, LEP,BAU,Mymensingh
Commercial chicken meat and Egg production	Bell DD And Weaver JRWD Kluwer Academic Publishers, Norwell USA
Commercial Broiler production	Johari DC and Hussain KQ, Internal book distribution co, Lucknow,India
Poultry Palon O Chikitsavidya	Prof. Dr. M.A. Samad, LEP,BAU,Mymensingh
Lavjanak Poshupakhi Palon O Adhunik Chikitsa	Prof. Dr. M.A. Samad, LEP,BAU,Mymensingh
Poultry Oupadon Projokti Nirdeshona	BLRI, Savar, Dhaka 2009
Avian Influenza	Swayne david E, et. al 2008, Black well publishing
HACCP & ISO 2000: Aplication to foods of animal origin	wiley-Black well 2009

3. Agricultural Economics

Name of the books	Author / publisher
Livestock Economy of India	I S AE Oxford & IBM Publications
Modern economic theory	K.K. Dewett
Macro Economic Analysis	Shapiro
Advanced micro economic theory	H.L.Ahuja
Agricultural Marketing	J.W. Barker 1989
Agricultural Marketing	James Vercammen 2011
Globalization & Agril. Marketing	Harish Nayyar, P. Ramaswamy, NIAM,Jaipur
Agricultural Marketing and price analysis	F. Bailey, Norwood, Joyson lusk 2007
Agricultural Marketing in India	S.S.Acharya, N.L.Agarwal 1987
Food & Agribusiness Marketing	Matthew Meulenberg
Economics	Paul Anthony Samuelson 1980
Agricultural Marketing system	Rhode
Agricultural Management Economics-Activity analysis and decision Making	Rae, Allan.N
Introduction to agricultural Economics	Oral, Pearson 1995
Agricultural Economics	D.S. Chauhan 2007
Agricultural Economics	Harold evan Drummond, John w. Goodwin
Agricultural Economics	George Augusti
Agricultural Economics	Henry C. Taylor

QUALIFICATION FOR STAFF

Designation	No. of Post	Qualification	Experience	Time basis
Principal /Director	01	B.Sc. A.H (Hons)/ D.V.M/ B.Sc. Ag.Econ (Hons)	Minimum 05(Five) years experience in teaching/research/ extension/Livestock farms/Livestock related marketing company	Full time
Senior instructor	Animal production - 01	B.Sc. A.H(Hons)	Minimum 03 (Three) years experience in teaching/research/ extension/Livestock farms/Livestock related marketing company	Full time
Instructor	Animal production - 01	B.Sc. A.H(Hons)	Experience in teaching/research/ extension/Livestock farms/Livestock related marketing company	Full time
	Veterinary medicine-01	D.V.M		
	Agricultural Economics -01	B.Sc. Ag.Econ (Hons)		
Administrative officer cum Accountant	01	B.A./ B.Com / B.Sc.	Two years of experience in teaching/Livestock farms or poultry marketing company	Full time
Lab. Attendant	02	H.S.C (Science)	One years of experience	Full Time
Dresser	01	S.S.C (Science)	One years of experience	Full time
Animal attendant	01	S.S.C	One years of experience	Full Time
Office Pion	01	S.S.C/ equivalent	N.A.	Full time

Laboratory

1. Animal production lab. – 01
2. Veterinary lab and clinic- 01
3. Animal Rearing Unit- 01

Space for the Class Room

01	Class room area	Number of room – 02	Space: 24X20=480 sq. ft.
02	Laboratory	Number of lab. - 02	Space: 20X15 = 300 sq. ft.
03	Veterinary Clinic	Number - 01	Space: 30X20 = 600 sq. ft.
04	Animal Rearing Unit	Need basis	Space: 30X20 = 600 sq. ft.