

01- Anatomy and Embryology

Compulsory courses

Contents	Courses	Code
<ul style="list-style-type: none"> • Osteology – Myology – Arthrology - Embryogenesis (from gametogenesis to placentation) - Organogenesis (development of body systems) - Dissection of the whole body and surface anatomy (head & neck, fore & hind limbs, thoracic & abdominal & pelvic wall) 	Basic and fundamental General Anatomy and general embryology	301-2011
<ul style="list-style-type: none"> • Upper digestive system- Lower digestive system- Accessory glands (liver, pancreases, spleen) - Comparative anatomy of the nasal cavity, nasopharynx, Larynx, Trachea and bronchi, Lung and pleura. 	Basic and fundamental anatomy and embryology of Digestive and respiratory systems in domestic animals	301-2012
<ul style="list-style-type: none"> • Anatomical studies on the different components of urogenital system which include: Kidney , ureter , urinary bladder , urethra , ovary , uterine tube , uterus , vagina , vulva , mammary glands, testes, scrotum, epididymis , ductus deferens, male accessory genital gland , penis . 	Basic and fundamental anatomy and embryology of Urogenital system in domestic animals	301-2013
<ul style="list-style-type: none"> • External and internal morphology of the heart. Relationship of heart and parts of pericardium. Blood vessels of different parts of body. Study of lymphatic system. Peripheral nervous system- Central nervous system. 	Basic and fundamental anatomy and embryology Circulatory and nervous system in animals	301-2014

02- Histology

Compulsory courses

Contents	Courses	Code
<ul style="list-style-type: none"> • Study of Membranous organelles, Non membranous organelles and Nucleus by EM, Study of DNA, Cell cycle, and chromosomal anomalies. 	Cytology and Cytogenetic	302-2021
<ul style="list-style-type: none"> • Epithelium - Connective tissue proper - Supportive connective tissue- Muscular tissue (muscles)- Nervous tissue - Study blood ,bone marrow and hemopoiesis 	Fundamental body tissues	302-2022
<ul style="list-style-type: none"> • Studying the samples, fixation, dehydration, clearing, impregnation and embedding in paraffin and different techniques of staining of sections and different strains of carbohydrates, protein and lipids. 	Tissue technology	302-2023
<ul style="list-style-type: none"> • Comparative histological and histochemical studies of digestive system, respiratory, cardiovascular, endocrine, male, female reproductive, lymphatic systems and skin. 	Applied vet. histology	302-2024

03- Physiology

Compulsory courses

Contents	Courses	Code
<ul style="list-style-type: none"> • An introduction to physiology, which include the division of the body systems and functional relationship of these systems with each other in the body cell biology and function of each cell type and suitability of each cell of structure to its function 	Principles of physiology(Advanced)	303-2031
<ul style="list-style-type: none"> • Study different types of blood cells and the function of each - normal levels of the components of plasma and the function 	Physiology of blood and body	303-2032

of each - mechanisms of blood coagulation- study various types of body fluids in terms of mechanism of their formation and movement in the body, and their function	fluids	
• Endocrine glands (pituitary, thyroid and par thyroid gland, adrenal, islets)	Endocrine physiology	303-20A33
• Functional structure of the nervous system - structure of the nerve cell and their physiology and types and generation of nerve impulses and properties of nerves - mechanical transmission of nerve signals and the functional division of the nervous system to the Functional structure of muscles	Physiology of CNS and muscles	303-2034

04- Biochemistry

Compulsory courses

Contents	Courses	Code
<ul style="list-style-type: none"> • Chemistry of carbohydrates, proteins and lipids • Chemistry of vitamins, Chemistry of enzymes, general view, Coenzymes, chemistry of hormones Putrefaction and detoxification, animal pigments. 	Principles of Biochemistry	304-2041
<ul style="list-style-type: none"> • Advanced biochemistry of tissues and body fluids, • Fluids electrolytes and acid base balance: gas transport, electrolyte status of blood and tissue, control of acid base balance. Biochemical structure of different tissues, (muscle, nerve), cell membrane and cell organelles, apoptosis, biochemical aspects of membrane receptors, biochemical constituents of blood , urine, milk, semen, synovial and cerebrospinal fluid. 	Biochemistry of tissues and body fluids	304-2042
<ul style="list-style-type: none"> • Biochemistry of nucleotides and nucleic acids: - Molecular structure of nucleosides, nucleotides. Molecular composition and structure of nucleic acids, chemical properties and stability 	Biochemistry of nucleotides and nucleic acids	304-2043
<ul style="list-style-type: none"> • Pathways of intermediary metabolism by which all cells synthesize and degrade carbohydrates, lipids (fats), and nitrogenous compounds. 	Biochemical pathways	304-2044

05- Animal, Poultry and Fish Breeding and Production

Compulsory courses

Contents	Courses	Code
<ul style="list-style-type: none"> • Qualitative and quantitative traits - Relationship and mating systems -Genetic parameters -Genetic selection response and selection deferential -Directional selection -Economic selection index for single and multiple traits 	Basics of animal, poultry and fish breeding	305-2051
<ul style="list-style-type: none"> • Principles of dairy cattle production - Principles of beef cattle production 	Cattle Production	305-2052
<ul style="list-style-type: none"> • White meat production and rabbits and their requirements- Breeder and commercial layer productivity and their requirements - Freshwater Fish Breeding and Production - Marine Species Reproduction and hatchery operation 	Poultry, rabbit and fish production	305-2053
<ul style="list-style-type: none"> • Breeding program and selection in small ruminants 	Sheep, goats and camel	305-2054

<ul style="list-style-type: none"> • Reproduction in small ruminants - Care of the dam and newborn - Flock management calendar- Fattening sheep and goats- Camel reproduction - Camel cow and calf management- Basic camel management- Basics of camel production 	production	
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------	--

06- Veterinary Economics and Farm Management

Compulsory courses

Contents	Courses	Code
<ul style="list-style-type: none"> • Economic basis and its application in veterinary practice - Supply and demand of veterinary economics. • Importance of economic information in veterinary business. Veterinary business management. Farm planning -Economics of animal production projects -Evaluation of animal production projects 	Veterinary economic and its application on animal production programs	305-2061
<ul style="list-style-type: none"> • Economics basis - Marketing animal products -Management of animal production- Evaluation of animal production projects. 	Economics of poultry production	305-2062
<ul style="list-style-type: none"> • Economics of Marketing animal products- -Management marketing practices- Marketing channels and agencies- Problem of animal production marketing. 	Marketing of animal, poultry and fish production farms	305-2063
<ul style="list-style-type: none"> • Feasibility studies and its economic importance. • Importance of feasibility studies. Divisions of feasibility studies. Application of feasibility studies. Evaluation of feasibility studies. 	Basis of feasibility studies of animal production farms	305-2064

07- Genetics and Genetic Engineering

Compulsory courses

Contents	Courses	Code
<ul style="list-style-type: none"> • Cell genetics and chromosomal abnormalities - Cell cycle - Chromatin structure - Mitotic chromosome - Karyotyping, Banding technique in karyotyping - Structural chromosomal aberrations - Numerical chromosomal aberrations 	Cell genetic and chromosomal abnormalities	305-2071
<ul style="list-style-type: none"> • Molecular genetics and veterinary applications - Structure of Nucleic acid - DNA replication- Genetic expression- regulation of protein synthesis- Recombinant vaccines - Genetics and animal diseases 	Molecular genetics and veterinary applications	305-2072
<ul style="list-style-type: none"> • Gene manipulation - DNA structure - - Functional unit of inheritance, the gene - Establishing gene libraries - Transgenes - Some methods of studying the genome. 	Gene manipulation and Studying the genome	305-2073
<ul style="list-style-type: none"> • Major histocompatibility complex (MHC) - Genetic resistance and pathogens- Genetic control of inherited and non-inherited disease - Gene Therapy 	Genetics of animal diseases	305-2074

08- Pharmacology

Compulsory courses		
Contents	Courses	Code
<ul style="list-style-type: none"> • Pharmacopoeias and official books of drugs - Drug sources - Pharmaceutical preparations and drug forms - Drug routes of administration - Pharmacokinetics and Drug residues - Pharmacodynamics - Factors affecting drugs actions and doses. 	General Pharmacology	306-2081
<ul style="list-style-type: none"> • Physiological considerations about Chemical transmitters and neurohumeral transmission- Autonomic drugs and receptors- Sympathomimetic and antiadrenergics - Parasympathomimetics and parasympatholytics- Ganglionic stimulants and ganglionic blockers- Skeletal muscle relaxants- Autacoids and Anti-inflammatory agents- Stimulants and depressants of CNS- General and local anaesthetics. 	Nervous system pharmacology	306-2082
<ul style="list-style-type: none"> • Drugs acting on gastrointestinal tract - Drugs acting on respiratory systems- Drugs acting on cardiovascular system - Drugs acting on reproductive system - Drugs acting on urinary system - Drugs acting on the Skin - Drugs acting on the eye. 	Systemic pharmacology	306-2083
<ul style="list-style-type: none"> • Introduction to chemotherapy - Drug resistance and residues - Antimicrobial agents - Chemotherapy of helminth infections and antiprotozoal agents - Chemotherapy of tumors - Insecticides and rodenticides - Antiseptics and disinfectants - Vaccines and antisera - Clinical application of drugs in different field cases. 	Chemotherapy	306-2084
09- Pathology		
Compulsory courses		
Contents	Courses	Code
<ul style="list-style-type: none"> • Cell and tissue death Gangrene - Post mortem changes • Disturbance in cell metabolism and growth - Hyperemia – Hemorrhage – Oedema - Thrombosis 	Cell Pathology, Metabolism and Growth and Circulatory disorders	307-2091
<ul style="list-style-type: none"> • Inflammatory process - Resolution and repair - Immunopathology 	Inflammation and Repair	307-2092
<ul style="list-style-type: none"> • Pathological calcification - Exogenous pigmentation - Endogenous pigmentation - Jaundice 	Mineral deposit and Pigmentation	307-2094
<ul style="list-style-type: none"> • Tumorigenesis as a multistep process - general features of tumorigenesis and molecular bases - genetic aspects of tumorigenesis - tumour immunology - Diagnostic aspect of tumours and tumour markers 	Morphological Oncology	307-2095
10- Parasitology		
Compulsory courses		
Contents	Courses	Code
<ul style="list-style-type: none"> • History, classification, general account and economic importance of Platyhelminthes. Morphology, epidemiology, life cycle, pathogenesis, clinical signs, diagnosis and control measures of trematodes, nematodes, 	Helminthology	308-2101
<ul style="list-style-type: none"> • Introduction to Medical Entomology. Arthropods as a cause and carrier of diseases. Development and Classification of insects and arachnids. Mouth parts and their importance in the transmission of diseases. Insecticidal and acaricidal practices. Morphology; life cycle, medical importance and control of the following insects and arachnids. Cockroaches and beetles; Bed bugs, conenose and other bugs; Sucking and biting lice; Simulid Gnats, Phlebotomus flies and Mosquitoes; Horse flies, Deer flies, Snipe flies Syrphid flies, Muscoid flies, 	Veterinary medical Entomology	308-2102

Louse fly; House fly and its relatives. Tsetse flies, Stomoxys flies, Horn flies, Myiasis causing flies, Fleas and Ticks. Mites and Pentasomids, Venomous and Urticarial Arthropods.		
<ul style="list-style-type: none"> • Introduction to the protozoa; Anatomy/Structure, locomotion, nutrition, reproduction and lifecycle of protozoa; History and classification of phylum protozoa; Evaluation of symbiotic protozoa; Haemoflagellates and other Zoomastigophora; Histomonas, Parhistomonas & related forms; Trichomonads and other flagellates; Amoeba and Giardia; Apicomplexa, Coccidia proper and Hepatozoans; Cryptosporidium, Plasmodium, Haemoproteus and Leucocytozoans; Sarcocystis, Toxoplasma and related protozoa; Piroplasmids; Ciliata and Gregarina. 	Protozoology	308-2103
<ul style="list-style-type: none"> • Introduction; Operation and maintenance of commonly used equipment; Procedures of collection, preservation and transportation of parasitic material; Faecal examination; direct, sedimentation and floatation techniques; Faecal culture, recovery and storage techniques; Coccidial sporulation, Recovery of larval parasites from soil, tissue and pastures. Examination of vectors for larval forms; Egg/larval counts in samples; Micrometry; Preservation and staining of parasites; Preparation of whole mounts; Direct and indirect blood examination; Methods of examination of urine, sputum, aspirates, biopsies for parasitic infections; Examination of skin scrapings for ectoparasites; Preparatory techniques for electron microscopy. Immunodiagnostic techniques. 	Laboratory diagnosis of parasites infection	308-2104

11- Nutrition and Clinical Nutrition

Compulsory courses

Contents	Courses	Code
<ul style="list-style-type: none"> • Body and plant Composition, water, carbohydrates, Proteins, Fat, Minerals and Vitamins – Feedstuffs Classification, composition and nutritive value, inclusion rate 	Advanced Basic Animal nutrition	309-2111
<ul style="list-style-type: none"> • Ingredient purchasing and receiving - Feed manufacturing process - Finished feed sampling, inspection and labeling - Sanitation and pest/rodent control - Feed product investigation and recalls - Feed mill process control 	Quality assurance programs in feed manufacturing mill	309-2112
<ul style="list-style-type: none"> • Feed stuffs - Feed evaluation - Ration formulation - Dairy nutrition - Beef nutrition - Poultry and Rabbit Nutrition - Fish Nutrition - Sheep and Goat Nutrition - Equine Nutrition - Pet animal Nutrition 	Applied Nutrition	309-2113
<ul style="list-style-type: none"> • Feeding of animal under, heat, disease, vaccine, crowdedness or other stresses (Modifications in diet compositions and specific additives or / or feeding managements 	Nutrition and Stress	309-2114

12- Bacteriology, Mycology and Immunology

Compulsory courses

Contents	Courses	Code
<ul style="list-style-type: none"> • Introduction, basic bacterial structure, principals of bacterial Growth and reproduction. Basis of bacterial genetics, principals of bacterial virulence, classification of bacteria. Gram-negative and Gram-positive bacteria 	Basic General Bacteriology	310-2121
<ul style="list-style-type: none"> • Introduction, advances in bacterial classification, advances in Gram-positive and Gram-negative bacteria 	Basic Systematic Bacteriology.	310-2122
<ul style="list-style-type: none"> • Introduction, advances in immunology, innate immunity, advances in complement, advances in phagocytosis, advances in antigen, immunoglobulin, cell-mediated, autoimmune diseases, hypersensitivity 	Basic Immunology	310-2123
<ul style="list-style-type: none"> • Introduction, advanced fungal structure, advanced fungal Growth and reproduction. Advanced fungal genetics, 	Basic Mycology	310-2124

advanced fungal virulence, moulds, yeasts and diphasic fungi		
13- Virology		
Compulsory courses		
Contents	Courses	Code
<ul style="list-style-type: none"> • Definition of Virus, Virus shape, virus structure, virus replication, virus tropism, Effect of viruses on host cells, DNA viruses, RNA viruses 	Basic Virology	311-2131
<ul style="list-style-type: none"> • Collection of viral samples ,Isolation and propagation of viruses, serological identification of viruses 	Diagnostic Virology	311-2132
<ul style="list-style-type: none"> • Study Determinants of host resistance, interference phenomenon, Vaccination against viral infections 	Viral immunity	311-2133
<ul style="list-style-type: none"> • Types of tissue culture, preparations of tissue culture, Isolation of viruses by using tissue culture 	Tissue Culture and virus cultivation	311-2134
14- Forensic Medicine and Toxicology		
Compulsory courses		
Contents	Courses	Code
<ul style="list-style-type: none"> • Identification – Death – Wounds -Thermal injuries – Asphyxia – Abortion – Infanticides - Medical rules and ethics 	Forensic Medicine and PM examination	312-2141
<ul style="list-style-type: none"> • Basic of general toxicology – Corrosives - Metallic poisons – Pesticides - Animal poisoning - Volatile gases poisoning – Mycotoxicosis - Poisonous plants 	Veterinary clinical toxicology	312-2142
<ul style="list-style-type: none"> • Essential clinical toxicology - Analytical techniques • Essential therapeutics - Trace elements and toxic metals • Drug abuse and forensics - Laboratory and personal safety - Practical project and dissertation 	Diagnosis and treatment of toxicity cases	312-2143
<ul style="list-style-type: none"> • DNA mutations and chromosomal aberrations- DNA repair - Genotoxic agents – physical, biological, chemical - Mutagens, carcinogens, antimutagens and anticarcinogens - Molecular basis of disease - Strategy and guidance of genotoxic investigations - Technologies for toxicity assessment 	Molecular and genetic toxicology	312-2144
15- Hygienic control of Meat and Meat products		
Compulsory courses		
Contents	Courses	Code
<ul style="list-style-type: none"> • Meat composition- keeping quality of meat - Factors affecting meat composition - Nutritive values of meat • Hygienic handling of meat - meat spoilage - Basis for hygienic production of meat - Knowledge about meat-borne pathogens - Sanitary condition of meat carcasses • Hygienic measures during production of meat products 	Meat safety	313-2151
<ul style="list-style-type: none"> • Assessment of plant hygiene - Heat treatment - Starter culture - Main steps in manufacture of meat and fish products - Application of HACCP system during manufacturing meat - Chemistry and microbiology of meat products - Spoilage and defects of food products 	Technology of Meat and Meat products	313-3152

<ul style="list-style-type: none"> • Sources of contamination of meat and fish and their products - Factors affecting microbial growth - Indicator organisms- Microbiology of meat - Microbiology of different meat products - Diseases transmitted through meat and its products - meat-borne pathogens and spoilage organisms 	Microbiology of Meat and Meat products.	313-2153
<ul style="list-style-type: none"> • Sampling of food (meat and their products) - Food inspection- Rapid methods for meat analysis - Testing meat products for adulteration- Detection of potential hazardous substances in food - Testing physical and chemical constants of meat 	Analysis of Meat and Meat products	313-2154

16- Hygiene Control of Milk and Milk products

Compulsory courses

Contents	Courses	Code
<ul style="list-style-type: none"> • Milk composition -hygienic handling of raw milk • Milk spoilage (fermentation) - Abnormal milk and methods of its detection - clean milk production • Milk-borne pathogens - Sanitary and keeping quality of milk- Hygienic handling of eggs and its products • Egg spoilage - Microbiological quality of eggs and its products 	Hygienic measures for production of milk, eggs and their products	313-2161
<ul style="list-style-type: none"> • Introduction, standards and legislations - Food Hygiene • Food Contamination - Risk assessment in dairy products 	Quality assessment of milk, eggs and their products	313-2162
<ul style="list-style-type: none"> • Recent methods for identification of microorganisms in milk and dairy products - Source of contamination - Common pathogens – HPLC – GLC – ELISA- PCR 	Microorganisms transmitted through milk, eggs and their products	313-2163
<ul style="list-style-type: none"> • HACCP (Introduction and legislations) - Food Hygiene • Food Contamination - Standard measures for cleaning and disinfection - Technology of dairy products - • Application of HACCP in dairy products 	Milk technology and HACCP system application on dairy plants	313-2164

17- Clinical Pathology

Compulsory courses

Contents	Courses	Code
<ul style="list-style-type: none"> • Cells and Composition of the Peripheral Blood - Hematopoiesis and the Bone Marrow - Metabolism and Function of Erythrocytes and the Metabolism of Iron- Anemia - Hematopoietic and Lymphoid Neoplasms - Quantitative Disorders of Platelets 	Hematology	314-2171
<ul style="list-style-type: none"> • Principles of measurement, testing strategies, accuracy and source of errors- Clinical evaluation of Ca, P, and Mg, glucose, ketoamines, vitamin B12, folic acid levels- hormones levels - plasma proteins 	Clinical Chemistry	314-2172
<ul style="list-style-type: none"> • Disorders of Sodium, Chloride, Potassium, Magnesium, Phosphorus, Calcium - Metabolic Blood Gas Disorders- Respiratory Acid-Base Disorders- Companion Exotic Animal Electrolyte and Acid-Base 	Acid and base balance and body fluid examination	314-2174

<ul style="list-style-type: none"> • Molecular Diagnosis: Polymerase chain reaction (PCR) - Cardiac Markers- Tumor Markers - Protein electrophoresis - Advanced immunoassays 	<p>باتولوجيا الكلينية متقدم Advanced clinical pathology</p>	314-2175
18- Fish Diseases		
Compulsory courses		
Contents	Courses	Code
<ul style="list-style-type: none"> • Bacterial fish Diseases- Parasitic fish Diseases - Mycotic fish Diseases - Viral fish Diseases - Nutritional deficiency fish diseases - Prevention and control 	Freshwater fish Diseases and control	315-2181
<ul style="list-style-type: none"> • Hazardous pollutants in water - Chemical residues in water - Advanced methods used in treatment of water pollution 	Improvement of water quality for fish culture	315-2182
<ul style="list-style-type: none"> • Bacterial fish Diseases - Parasitic fish Diseases • Mycotic fish Diseases - Viral fish Diseases - Nutritional deficiency fish diseases - Prevention and control 	Marine fish Disease and control	315-2183
<ul style="list-style-type: none"> • Bacterial fish Diseases - Parasitic fish Diseases • Mycotic fish Diseases - Viral fish Diseases 	Crustacean Diseases	315-2184
19- Infectious Diseases		
Compulsory courses		
Contents	Courses	Code
<ul style="list-style-type: none"> • Viral diseases, bacterial diseases, parasitic diseases and mycotic diseases of large ruminants 	Infectious diseases of large ruminants	316-2191
<ul style="list-style-type: none"> • Viral diseases, bacterial diseases, parasitic diseases and mycotic diseases of sheep and goats 	Infectious diseases of sheep and goats	316-2192
<ul style="list-style-type: none"> • Viral diseases, bacterial diseases, parasitic diseases and mycotic diseases of equines 	Infectious equine diseases	316-2193
<ul style="list-style-type: none"> • Viral diseases, bacterial diseases, parasitic diseases and mycotic diseases of pet animals 	Infectious diseases of Pet animals	316-2194
20- Internal Medicine		
Compulsory courses		
Contents	Courses	Code
<ul style="list-style-type: none"> • Diseases of digestive system and liver - diseases of respiratory system - Nutritional deficiency diseases - Diseases of urinary system - Diseases of Musculoskeletal system - Diseases of cardiovascular system- Diseases of blood and blood forming organs 	Ruminants Medicine	316-2201
<ul style="list-style-type: none"> • Diseases of digestive system and liver - diseases of respiratory system - Nutritional deficiency diseases - Diseases of urinary system - Diseases of Musculoskeletal system - Diseases of cardiovascular system- Diseases of blood and blood forming organs 	Equine Medicine	316-2202
<ul style="list-style-type: none"> • Introduction on metabolic disorder - Metabolic diseases associated with calcium, phosphorus, magnesium and energy metabolism - Prevention of metabolic disorders 	Metabolic diseases	316-2203
<ul style="list-style-type: none"> • Introduction on diseases of pets - Diseases of pet animals - Diagnosis and treatment - Prevention of pet diseases 	Pet animal medicine	316-2204
21- Veterinary Surgery		
Compulsory courses		
Contents	Courses	Code

<ul style="list-style-type: none"> • Inflammation - localized surgical affection -Hemorrhage and homeostasis - Affection of skin - Affections of bursae, cysts, tumors, hernias -Surgical disorders of body regions - Affection of lymphatic system, affection of muscles 	General Surgery	317-2211
<ul style="list-style-type: none"> • Pre-anaesthetic medications -Types of anaesthesia -Regional anaesthesia - General anaesthesia - Anaesthetic emergencies and accidents 	Anesthesia	317-2212
<ul style="list-style-type: none"> • Ophthalmology - Ear and horn affections - Respiratory system surgical affections - Digestive system surgical affections- Urogenital systems surgical affections - Mammary gland surgery. 	Special Surgery	317-2213
<ul style="list-style-type: none"> • X-rays and their behavior - The X-ray equipment - Types of X-ray Apparatus, Radiographic contrast agents, The darkroom - Protection practice - Physics and instrumentations of ultrasonography- Artifacts - Musculoskeletal system radiography and ultrasonography - Chest, abdomen, urogenital system radiography and ultrasonography. 	Diagnostic Imaging	317-2214

22- Theriogenology

Compulsory courses

Contents	Courses	Code
<ul style="list-style-type: none"> • Follicular dynamics and reproductive hormones <ul style="list-style-type: none"> • Controlled reproduction in farm animals <ul style="list-style-type: none"> • Causes of female infertility <ul style="list-style-type: none"> • Repeat breeders • Reproductive ultrasonography <ul style="list-style-type: none"> • Normal pregnancy • Disturbances arising from the fetal membranes, mother and foetus during pregnancy. <ul style="list-style-type: none"> • Normal and abnormal parturition • Normal and abnormal puerperium <ul style="list-style-type: none"> • Pregnancy diagnosis • Reproductive patterns in male animals. <ul style="list-style-type: none"> • Sexual behavior. <ul style="list-style-type: none"> • Fertility indices in males. • Forms of infertility in males. • Breeding soundness examination in males <ul style="list-style-type: none"> • Semen collection and evaluation. • Semen biochemistry and sperm morphology. <ul style="list-style-type: none"> • Semen dilution and processing. <ul style="list-style-type: none"> • Insemination technique. • Technology of sexed semen. • Superovulation, embryo collection and evaluation. <ul style="list-style-type: none"> • Techniques of embryo transfer. • IVM, IVF and associated techniques. 	Reproduction and infertility in females	318-2221
<ul style="list-style-type: none"> • Disturbances arising from the fetal membranes, mother and foetus during pregnancy. <ul style="list-style-type: none"> • Normal and abnormal parturition • Normal and abnormal puerperium <ul style="list-style-type: none"> • Pregnancy diagnosis 	Obstetrics	318-2222
<ul style="list-style-type: none"> • Reproductive patterns in male animals. <ul style="list-style-type: none"> • Sexual behavior. <ul style="list-style-type: none"> • Fertility indices in males. • Forms of infertility in males. • Breeding soundness examination in males <ul style="list-style-type: none"> • Semen collection and evaluation. • Semen biochemistry and sperm morphology. <ul style="list-style-type: none"> • Semen dilution and processing. <ul style="list-style-type: none"> • Insemination technique. • Technology of sexed semen. • Superovulation, embryo collection and evaluation. <ul style="list-style-type: none"> • Techniques of embryo transfer. • IVM, IVF and associated techniques. 	Male reproduction and infertility	318-2223
<ul style="list-style-type: none"> • Semen collection and evaluation. • Semen biochemistry and sperm morphology. <ul style="list-style-type: none"> • Semen dilution and processing. <ul style="list-style-type: none"> • Insemination technique. • Technology of sexed semen. • Superovulation, embryo collection and evaluation. <ul style="list-style-type: none"> • Techniques of embryo transfer. • IVM, IVF and associated techniques. 	Artificial Insemination and Embryo transfer in farm animals	318-2224

23- Animal and Poultry Behavior and Management

Compulsory courses

Contents	Courses	Code
<ul style="list-style-type: none"> • Definition of animal behavior common terms. <ul style="list-style-type: none"> • Aims of behavior, 	Applied Ethology and behavioral Patterns	319-2231

<ul style="list-style-type: none"> • Factors affecting Production of behavior. <ul style="list-style-type: none"> • Classification of behaviors, • Principles of animal Behavior and <ul style="list-style-type: none"> • Patterns of behavior 		
<ul style="list-style-type: none"> • Identification of ruminant • Definition of ruminant common terms <ul style="list-style-type: none"> • Behavior of cattle and Buffaloes • Management of cattle and Buffaloes <ul style="list-style-type: none"> • Behavior of sheep and Goat • Management of sheep and Goat <ul style="list-style-type: none"> • Behavior of camel • Management of camel 	Behavior and Management of Ruminant	319-2232
<ul style="list-style-type: none"> • Definition of poultry and rabbits common terms <ul style="list-style-type: none"> • Behavior and management of fowl • Behavior and management of turkey • Behavior and management of quails and pigeon <ul style="list-style-type: none"> • Behavior and management of ostrich • Behavior and management of rabbits • Identification of poultry and rabbits 	Behavior and Management of Poultry and Rabbits	319-2233
<ul style="list-style-type: none"> • General and Patterns of behavior of equine <ul style="list-style-type: none"> • Breeds of equine • Definition of equine common terms • Description and identification of equine <ul style="list-style-type: none"> • Management of Equine • Vices of equine 	Behavior and Management of Equine	319-2234

24- Animal, Poultry and Environment hygiene

Compulsory courses

Contents	Courses	Code
<ul style="list-style-type: none"> • Cattle and sheep housing, Ventilation • Air and water hygiene, Disinfections 	Basics of Livestock Hygiene	319-2241
<ul style="list-style-type: none"> • Hazardous pollutants in air • Chemical residues in water • Advanced methods used in treatment of water pollution 	Environmental Hygiene and pollution	319-2242
<ul style="list-style-type: none"> • Introduction of farm animal housing -systems of animal and poultry housing 	Farm Animals Housing	319-2243
<ul style="list-style-type: none"> • Types of disinfection- • Mode of action of disinfection • Hygienic disposal of disinfectant residues 	Disinfectants and Disinfection	319-2244

25- Zoonoses

Compulsory courses

Contents	Courses	Code
<ul style="list-style-type: none"> • Technical terms, Patterns of zoonoses spread, Sampling strategies, Basics of KAPs for Zoonoses, Basics of Zoonotic outbreak investigation and Basic prevention strategies 	Epidemiology of Zoonoses	319-2251

<ul style="list-style-type: none"> • Viroses of Farm animals, Bacterioses of Farm animals, Parasitioses of Farm animals, Mycoses of Farm animals and Rickettsioses of Farm animals. 	Farm animal Zoonoses	319-2252
<ul style="list-style-type: none"> • Viroses of birds, Bacterioses of birds, Parasitioses of birds, Mycoses of birds, Rickettsioses of birds and role of wild and migratory birds in spread of zoonoses. 	Bird Zoonoses	319-2253
<ul style="list-style-type: none"> • Water-borne zoonoses, Soil-borne zoonoses, Air-borne zoonoses, Plants-borne zoonoses and Prevention strategies 	Environmental Zoonoses	319-2254

26- Poultry Diseases

Compulsory courses

Contents	Courses	Code
<ul style="list-style-type: none"> • Salmonella- E coli- Fowl Cholera- ORT- Clostridia-Infectious Coryza- 	Bacterial diseases of Poultry	320-2261
<ul style="list-style-type: none"> • ND- AI-IB-ILT- IBD-REO viruses-Adeno viruses-Pox- Entero viruses-Duck viral Diseases-neoplastic diseases 	Viral diseases of Poultry	320-2262
<ul style="list-style-type: none"> • Aspergillosis- Candidiasis- Avian ring worm- Avian Mycotoxicosis 	Mycotic diseases of Poultry	320-2263
<ul style="list-style-type: none"> • Protozoa infection - Trematodes-Cestodes – Nematodes- Endoparasitic 	Parasitic diseases of Poultry	320-2264

Elective Courses

01- Anatomy and Embryology

Elective Courses		
Contents	Courses	Code
<ul style="list-style-type: none"> • Basic anatomical concepts of bird integument and associated cutaneous glands and horny structures, feathers, bird skeleton and muscles, bird digestive system, bird respiratory system, bird urogenital system, bird circulatory and nervous systems. 	Basic concepts on external and internal dissection of bird	301-201E
<ul style="list-style-type: none"> • Basic concepts of fish external anatomy, fins and scales, fish skeleton and muscles, fish digestive system, fish respiratory system, fish urogenital system, fish circulatory and nervous systems. 	Basic concepts on external and internal dissection of fish	301-202E
<ul style="list-style-type: none"> • Basic concepts on molecular changes associated with gametogenesis, fertilization, cleavage, gastrulation, placentation, congenital anomalies. 	Basic concepts on molecular embryology	301-203E
02- Histology		
Elective Courses		
Contents	Courses	Code
<ul style="list-style-type: none"> • Comparative histology and histochemistry of lymphatic nodule, aggregation, lymph node, spleen, thymus and bursa of Fabricius. 	Histology of immune system	302-201E
<ul style="list-style-type: none"> • Comparative histology and histochemistry of different organs of urinary, male and female genital systems. 	Histology of urogenital system	302-202E
<ul style="list-style-type: none"> • Comparative histology and histochemistry of skin components (epidermis, dermis, hair follicles and skin glands); hooves, claws and nails. 	Histology of skin and skin appendage	302-203E
<ul style="list-style-type: none"> • Histological and histochemical study of Digestive system , Respiratory system , Urogenital system , Immune system , Cardiovascular system , Endocrine system, Nervous system, Skin , Eye of domestic and wild birds 	Histology of domestic and wild birds	302-204E
<ul style="list-style-type: none"> • Histological and histochemical study of Digestive system , Respiratory system , Urogenital system , Immune system , Cardiovascular system , Endocrine system, Nervous system, Skin , Eye of fish and crustaceans 	Histology of fish and crustaceans	302-205E
<ul style="list-style-type: none"> • Comparative histological and histochemical study of upper and lower parts and main accessory glands of digestive system, also respiratory and cardiovascular systems. 	Histology of digestive, respiratory and cardiovascular systems	302-206E
03- Physiology		
Elective Courses		
Contents	Courses	Code
<ul style="list-style-type: none"> • Blood cells and the function of each - normal levels of the components of plasma and the function of each- mechanisms of blood coagulation - immune system and different types of immune cells and the functions of each cell type 	Physiology of blood and immunity	303-201E
<ul style="list-style-type: none"> • Respiration, excretion and digestion in fish- endocrine glands and hormones and their functions- reproduction , induced spawning and monosex production in fishes- Osmoregulation in fish 	Physiology of blood and body fluids	303-202E
<ul style="list-style-type: none"> • Impact of changes in temperature and humidity levels on the functionality and productivity of animals - how different 	Physiology of environment,	303-203E

animals body withstand these environmental changes and the mechanisms performed by the various objects of different animals to adapt to environmental changes to maintain homeostasis.	adaptation and stress	
• Endocrine glands in the body and hormones produced by them - function of each hormone and the various mechanisms of these hormone action	Physiology of hormones	303-204E
• Various types of body cells and their functions -	Physiology of cell and growth	303-205E

04- Biochemistry

Elective Courses

Contents	Courses	Code
• Chemistry of carbohydrates, proteins and lipids - Chemistry of vitamins, Chemistry of enzymes, general view, Coenzymes, chemistry of hormones - Putrefaction and detoxification, animal pigments.	Principles of Biochemistry	304-201E
• Biochemistry of male sex hormones. Synthesis and degeneration. Hormone receptors and biochemical action of hormones. Metabolism and interconversion of monosaccharides into fructose. Sources of energy required for sperm motility. Chemical and functional correlation in ejaculated semen. Biochemistry of seminal plasma and male accessory fluids.	Biochemistry of reproduction and Semen	304-202E
• Molecular structure and metabolism of carbohydrates, lipids and proteins and amino acids in fish. Biochemistry of vitamins, coenzymes, and hormones in fish.	Biochemistry of Fish	304-203E
• Molecular structure and metabolism of carbohydrates, lipids and proteins and amino acids in birds. Biochemistry of vitamins, coenzymes, and hormones in birds.	Biochemistry of birds	304-204E
• Metabolism of carbohydrates, metabolism of proteins and amino acids. Nucleosides and nucleotides synthesis and degeneration. DNA technology. Unit of transcription in bacteria: the operon. Lactose operon of E. coli, tryptophan operon of E. coli. Bacterial operons. Bacterial transposons.	Biochemistry of microbes	304-205E

05- Animal, Poultry and Fish Breeding and Production

Elective Courses

Contents	Courses	Code
• White meat production and rabbits and their requirements - Broiler and other poultry meat production - Production of Poultry Breeders and layers.	Poultry and rabbit production	305-201E
• Principles and guides for efficient beef cattle production- Growth and development of beef cattle, and growth promoters • Beef production systems	Beef cattle production	305-202E
• Herd Reproductive Efficiency- Milk Yield and Composition - Lactation Curve and Persistency- Body Condition	Dairy cattle production	305-203E
• Freshwater Fish Breeding and Production- Marine Species Reproduction and Production - Mating systems and genetic improvement in fish	Fish production	305-204E

<ul style="list-style-type: none"> • reeding program and selection in small ruminants- Reproduction in small ruminants - Care of the dam and newborn- Flock management calendar - Fattening sheep and goats- Keeping and using records 	<p align="center">Sheep, goat and camel production</p>	<p align="center">305-205E</p>
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------	---------------------------------------

06- Veterinary Economics and Farm Management

Elective Courses

Contents	Courses	Code
<ul style="list-style-type: none"> • Marketing importance in veterinary medicine-Veterinary resources- Risks in veterinary practice and its prevention. 	<p>Marketing of drugs and veterinary services</p>	<p>305-206E</p>
<ul style="list-style-type: none"> • Linear programming and its importance- Requirement of linear programming in ration formulation- Application of linear programming in ration formulation Using computer program 	<p>Economics of ration formulation</p>	<p>305-207E</p>
<ul style="list-style-type: none"> • I-Feasibility studies and its economic importance. For animal production farms-stages of feasibility studies-Importance of feasibility studies-Divisions of feasibility studies. Art side- Economic side- Application of feasibility studies-Evaluation of feasibility studies. 	<p>Feasibility studies of animal production farms.</p>	<p>305-208E</p>
<ul style="list-style-type: none"> • Economics basis- Marketing animal products- Management of animal production- Evaluation of animal production projects 	<p>Economies of animal production farms</p>	<p>305-209E</p>

07- Genetics and Genetic Engineering

مقررات اختياريه

Contents	Courses	Code
<ul style="list-style-type: none"> • Bacterial genome, Transduction - Transformation, Conjugation- Viral Nucleic acid, Bacteriophages - Oncogenic viruses, Viruses used in Genetic Engineering 	<p>Microbial Genetics</p>	<p>305-211E</p>
<ul style="list-style-type: none"> • Restriction Endonucleases - Recombinant vectors- Steps of recombinant DNA technology- Applications of Genetic engineering 	<p>Genetic Engineering</p>	<p>305-212E</p>
<ul style="list-style-type: none"> • Mutation and Mutagenes – Carcingenes - Oncogenic viruses – Oncogenes - Tumor suppressor genes - Cancer as a genomic disease 	<p>Genotoxicity</p>	<p>305-213E</p>
<ul style="list-style-type: none"> • Antibody molecule and its genetic assemblage- Genetic resistance in host- Genetic resistance in pathogens • Red cell antigens- MHC-Diseases associated with MHC 	<p>Immunogenetics</p>	<p>305-214E</p>

08- Pharmacology

Elective Courses

Contents	Courses	Code
<ul style="list-style-type: none"> • General anaesthesia - Classification of general anaesthesia - Local anaesthesia. 	<p>Pharmacology of surgery and anesthesia</p>	<p>306-201E</p>
<ul style="list-style-type: none"> • Drugs affecting water and electrolyte metabolism and acid base balance- Drugs affecting inorganic metabolism- Drugs affecting carbohydrate metabolism- Growth promoting agents- Treatment of metabolic disorders. 	<p>Pharmacology of metabolism</p>	<p>306-202E</p>

<ul style="list-style-type: none"> Pharmacokinetics, pharmacodynamics and interactions - Drugs affecting autonomic and central nervous systems - Autacoids and anti-inflammatory drugs- Drugs affecting digestive, urinary and reproductive, respiratory and cardiovascular systems - Drugs affecting skin and eye- Antimicrobial drugs- Anthelmintic and antiprotozoal agents - Drugs affecting metabolism and metabolic disorders- The general principles of clinical pharmacology and the baselines of drug selection in different field cases. 	Clinical Pharmacology	306-203E
<ul style="list-style-type: none"> Basic concepts about drug resistance- The mechanism of drug resistance - Types of drug resistance- The clinical importance of drug resistance 	Drug resistance	306-204E
<ul style="list-style-type: none"> Basic concepts about drug residues - Toxic effects of drug residues- Veterinary drugs and growth - promoters of residual concern- Permissible limits of drug residues- Methods for detection of drug residues- Control measures of drug residues. 	Veterinary drug residues	306-205E
<ul style="list-style-type: none"> Treatment of infectious respiratory diseases, neoplastic diseases, avian Adeno virus diseases, miscellaneous viral diseases, parasitic diseases 	Poultry pharmacology	306-206E

09- Pathology

Elective Courses

Contents	Courses	Code
<ul style="list-style-type: none"> Autoimmunity - resistance to bacteria-- resistance to viruses- immunity to parasites - inflammation 	Immunopathology.	307-201E
<ul style="list-style-type: none"> Tumorogenesis as a multistep process- general features of tumorogenesis and molecular bases - genetic aspects of tumorogenesis - tumour immunology- diagnostic aspect of tumours and tumour markers 	Oncology	307-202E
<ul style="list-style-type: none"> Toxins, xenobiotics, and toxicity - factors affecting toxic effects- mechanism of toxic cell injury - environmental pollutants - pathogenesis and tissue reaction to pollutants 	Toxicological and Environmental pollutants Pathology	307-203E
<ul style="list-style-type: none"> Cell and tissue reaction to injury - circulatory reaction to injury- inflammation- pathology of hoof affections- pathology of eye affections- tissue grafting 	Surgical Pathology	307-204E
<ul style="list-style-type: none"> Genomic imperfections and chromosomal abnormalities - errors in histogenesis and disturbances of growth- genetics and immune response- genetics and tumour formation - teratology and teratogens 	Genetic Pathology	307-205E
<ul style="list-style-type: none"> Pathogenesis and tissue reaction to viruses- virus cytopathology- ultrastructural features of viruses and cell interaction-detection of viral antigen- virus inclusions - viral diseases of farm and domestic animals 	Pathology of Viral Diseases in Animals	307-206E
<ul style="list-style-type: none"> Pathogenesis and tissue reaction to bacteria- pathogenesis and tissue reaction to fungus - ultrastructural features of bacteria and cell interaction- ultrastructural features of fungus and cell interaction - detection of bacterial antigen- detection of fungal antigen- bacterial and fungal diseases of farm and domestic animals 	Pathology of Bacterial and Mycotic Diseases in Animals	307-207E
<ul style="list-style-type: none"> Pathogenesis and tissue reaction to parasites - parasites cytopathology - ultrastructural features of parasites and cell interaction - detection of parasitic antigen- parasitic diseases of farm and domestic animals 	Pathology of Parasitic Diseases in Animals	307-208E
<ul style="list-style-type: none"> viral diseases - bacterial diseases - parasitic nutritional diseases - mycotic diseases 	Pathology of Avian Diseases	307-209E
<ul style="list-style-type: none"> viral diseases - bacterial diseases - parasitic nutritional diseases - mycotic diseases 	Pathology of Fish Diseases	307-210E
<ul style="list-style-type: none"> pathology of heart, arteries, veins and blood capillaries pathology of nasopharynx, larynx, trachea, bronchi and lung 	Pathology of Cardiovascular and Respiratory system diseases	307-211E

10- Parasitology

Elective Courses

Contents	Courses	Code
<ul style="list-style-type: none"> • Morphology, epidemiology, pathogenesis, clinical signs, diagnosis and control measures of cestodes, trematodes, nematodes and protozoa parasites infecting farm animals. 	Farm animal parasites	308-201E
<ul style="list-style-type: none"> • Morphology, epidemiology, pathogenesis, clinical signs, diagnosis and control measures of parasites transmitted by different foods 	Food and water parasites	308-202E
<ul style="list-style-type: none"> • Morphology, epidemiology, pathogenesis, clinical signs, diagnosis and control measures of cestodes, trematodes, nematodes and protozoa parasites infecting birds and rabbits. 	Parasites of birds and rabbits	308-203E
<ul style="list-style-type: none"> • Morphology, epidemiology, pathogenesis, clinical signs, diagnosis and control measures of cestodes, trematodes, nematodes and protozoa parasites infecting fish. 	Parasites of fishes	308-204E
<ul style="list-style-type: none"> • Morphology, epidemiology and role of different Mollusca in transmission of trematodes, nematodes and cestodes parasites infecting animals, birds and fishes and their control 	Snails and its veterinary medical importance	308-205E
<ul style="list-style-type: none"> • Morphology, epidemiology, life cycle, pathogenesis, clinical signs, diagnosis and control measures of trematodes, nematodes, 	Veterinary Helminthology	308-206E
<ul style="list-style-type: none"> • Morphology, epidemiology, pathogenesis, clinical signs, diagnosis and control measures of zoonotic parasites transmitted among animals and human being. 	Zoonotic parasites	308-207E

11- Nutrition and Clinical Nutrition

Elective Courses

Contents	Courses	Code
<ul style="list-style-type: none"> • Dry cow nutrition- Early lactating cow nutrition - Mid lactating cow nutrition- Late lactating cow nutrition- Calf nutrition- Heifer nutrition - Nutritional disorders of dairy cow 	Advanced Dairy nutrition	309-201E
<ul style="list-style-type: none"> • CHO requirements for fattening animals , Crude Protein requirements for fattening animals, Minerals for fattening animals, Vitamins for fattening animals, Growth promoters and Nutritional disorders of fattening animals 	Advanced Beef nutrition	309-202E
<ul style="list-style-type: none"> • Feedstuffs of the Fish, Nutrient requirements for Fish, Deleterious substances in the feeds affecting Fish, Nutritional deficiency diseases affecting Fish, Metabolic diseases affecting Fish 	Advanced Fish nutrition	309-203E
<ul style="list-style-type: none"> • Nutrient requirements for Broilers, Nutrient requirements for Layers and Breeders, Rabbit nutrition, Nutritional deficiency diseases affecting poultry, Metabolic diseases affecting poultry, Nutritional deficiency diseases affecting Rabbit, Metabolic diseases affecting Rabbit 	Advanced Poultry and rabbit nutrition	309-204E
<ul style="list-style-type: none"> • Nutrition during breeding season, Nutrition of pregnant ewes and goat, Nutrition of lactating ewes and goat, Nutrition of lambs and kids , Nutritional disorders of sheep and goat 	Advanced Sheep and Goat Nutrition	309-205E
<ul style="list-style-type: none"> • Nutrition of foal, Nutrition of pregnant mare, Nutrition of lactating mare, Nutrition of working and raising horses, Nutritional disorders of equines 	Advanced Equine nutrition	309-206E
<ul style="list-style-type: none"> • Nutrient requirements for camel, Nutrition of lactating she-camel, Nutrition of calf-camel, Nutritional disorders of camels, Nutrition of racing camels 	Advanced Camel nutrition	309-207E
<ul style="list-style-type: none"> • Feedstuffs of the Lab animals, Nutrient requirements for Lab animals, Deleterious substances in the feeds affecting Lab animals, Nutritional deficiency diseases affecting Lab animals, Metabolic diseases affecting Lab animal 	Advanced Experimental animal nutrition	309-208E

<ul style="list-style-type: none"> • Feedstuffs of the pet animals- Nutrient requirements for pet animals- Deleterious substances in the feeds affecting pet animals - Nutritional deficiency diseases affecting pet animals- Metabolic diseases affecting pet animals 	Advanced Pet animal nutrition	309-209E
<ul style="list-style-type: none"> • Feedstuffs of the Wild animals - Nutrient requirements for Wild animals - Deleterious substances in the feeds affecting Wild animals - Nutritional deficiency diseases affecting Wild animals - Metabolic diseases affecting Wild animals 	Advanced Pet animal nutrition	309-210E
<ul style="list-style-type: none"> • Additives that influence feed stability, property and manufacturing - Additives that influence growth performances - Additives that influence consumer acceptance 	Feed additives	309-211E

12- Bacteriology, Mycology and Immunology

Elective Courses

Contents	Courses	Code
<ul style="list-style-type: none"> • Basic serology, collection and preparation of serological samples. Agglutination tests, precipitation tests, complement fixation test, immunofluorescence tests, different ELISA tests 	Basic Immunological diagnostic Methods	310-201E
<ul style="list-style-type: none"> • Basic methods of antimicrobial resistance in bacteria, bacterial mutation, efflux pump, Beta-lactamases, plasmid-mediated resistance, porin selective permeability, mechanisms of actions of antibiotics on bacterial cells 	Basic Antimicrobial Resistance	310-202E
<ul style="list-style-type: none"> • Basic isolation and identification methods of contaminating bacteria and fungi including Salmonella, Staphylococcus aureus, Enterotoxigenic E. coli, Enterohaemorrhagic E. coli O157:H7, Listeria, etc. and Mycotoxicosis. 	Basic Food Contamination Bacteria and Fungi	310-203E
<ul style="list-style-type: none"> • Basic isolation and identification methods of bacteria and fungi pathogenic for poultry including Salmonella, avian pathogenic E. coli, Mycoplasma, Avibacterium, Pasteurella, Staphylococcus aureus, etc. and Aspergillus spp. and Mycotoxins 	Basic Poultry Bacteriology and Mycology	310-204E
<ul style="list-style-type: none"> • Basic isolation and identification methods of bacteria and fungi pathogenic for fishes including Aeromonas, Edwardsiella, Streptococcus iniae, Renibacterium salmoninarum, Flexibacter columnaris, Saprolegnia species, etc. 	Basic Fish Bacteriology and Mycology.	310-205E
<ul style="list-style-type: none"> • Basic isolation and identification methods of bacteria and fungi causing mastitis including Staphylococci, Streptococci, Corynebacteria, coliforms, Pasteurella, Pseudomonas, Mycoplasma, Candida, Cryptococcus, Aspergillus etc. 	Basic Mastitis Causing Bacteria and Fungi	310-206E
<ul style="list-style-type: none"> • Basic isolation and identification methods of bacteria and fungi important for the public health including Salmonella, Brucella, Mycobacteria, Coliform, Enterohaemorrhagic E. coli O157:H7, Staphylococci, Streptococci, Candida, Aspergillus, Mycotoxins etc. 	Basic Public Health and Environmental Bacteriology and Mycology	310-207E
<ul style="list-style-type: none"> • Basic isolation and identification methods of important zoonotic bacteria and fungi including, Brucella, Mycobacteria, Salmonella, Bacillus anthracis, Enterohaemorrhagic E. coli O157:H7, Listeria, Candida, Aspergillus, Mycotoxins etc. 	Basic Zoonotic Bacteriology and Mycology	310-208E

<ul style="list-style-type: none"> • Basic isolation and identification methods of important bacteria and fungi infecting the reproductive system including, Brucella, Campylobacter, Taylorella equigenitalis, Listeria, Leptospira, Candida, Aspergillus, etc. 	Basic Reproductive Bacteriology and Mycology.	310-209E
<ul style="list-style-type: none"> • Basic isolation and identification methods of important bacteria and fungi transmitted through A. I. including, Brucella, Campylobacter, Taylorella equigenitalis, Listeria, Leptospira, etc 	Basic Artificial Insemination Bacteriology and Mycology	310-210E

13- Virology

Elective Courses

Contents	Courses	Code
<ul style="list-style-type: none"> • Study of Viruses infect Poultry and Rabbits as Newcastle disease virus, infectious bursal disease virus, Rabbit hemorrhagic septicemia virus 	Viruses of poultry and rabbit	311-201E
<ul style="list-style-type: none"> • Study of viruses infect bovine and camels as cattle plague, foot and mouth disease virus 	Viruses of Bovine and camel	311-202E
<ul style="list-style-type: none"> • Study of viruses infect equine as equine herpes virus 1 and 4, equine, Coital exanthema virus 	Viruses of Equine	311-203E
<ul style="list-style-type: none"> • Study of viruses infect wild animals and birds as Rabies and Newcastle disease virus and equine herpes virus type 9 	Viruses of Wild Birds and animals	311-204E
<ul style="list-style-type: none"> • Study of viruses infect fish 	Viruses of Fish	311-205E
<ul style="list-style-type: none"> • Study of Viruses infect pet animals as Rabies, canine distemper virus 	Viruses of Pet animals	311-206E
<ul style="list-style-type: none"> • Viral host immunity, interferon, types of vaccines, adjuvant, preparation of vaccines 	Preparation and Evaluation of viral vaccines	311-207E

14- Forensic Medicine and Toxicology

Elective Courses

Contents	Courses	Code
<ul style="list-style-type: none"> • Toxicokinetics and toxicodynamics - Toxicity and safety of drugs and medicinal preparations- A Guidance manual for the toxicity assessment of drugs and medicinal preparations - Management of drugs and medicinal preparations toxicity cases- Antidotal therapy 	Drugs and Medicinal preparation toxicities	312-201E
<ul style="list-style-type: none"> • Environmental toxicology - Water management - Pollution biomarkers in environmental bio monitoring - Pollution biomarkers in animal bio monitoring - Environmental toxicology and pollution monitoring project - Permissible limits of different toxicant in water, food and feed 	Biomarkers of environmental pollutions	312-202E
<ul style="list-style-type: none"> • Basic of general toxicology -Clinical spectrum of poisoning - Poison prevention strategies - Clinical diagnostic techniques - General approach to treatment 	Farm animals' toxicity	312-203E
<ul style="list-style-type: none"> • Basic of general toxicology - Clinical spectrum of poisoning - Poison prevention strategies - Clinical diagnostic techniques - General approach to treatment 	Pet animals' toxicity	312-204E
<ul style="list-style-type: none"> • Basic of general toxicology - Clinical spectrum of poisoning - Poison prevention strategies - Clinical diagnostic techniques - General approach to treatment 	Toxicity in poultry farms	312-205E
<ul style="list-style-type: none"> • Basic of general toxicology - Toxicants from plants - Toxicants from animals - Bacterial intoxications - Fungal intoxications - Chemical intoxications 	Feed related toxicants	312-206E
<ul style="list-style-type: none"> • Essential clinical toxicology - Analytical techniques- Systematic toxicological analysis of several classes of toxicants and their metabolites - Systematic toxicological analysis of several classes of drugs and their metabolites - Bio analytical methods for doping - Laboratory and personal safety 	Analytical methods for toxicants and doping	312-207E
<ul style="list-style-type: none"> • Major public health hazards pollutants - Basic principles: 	Toxicology and public health	312-208E

<p>factors affecting toxicity - Toxicokinetics and toxicodynamics - Toxicity testing, dose response and risk assessment - Environmental carcinogenesis - Biomarkers of exposure and susceptibility factors-Approaches to primary and secondary prevention</p>		
15- Hygienic control of Meat and Meat products		
Elective Courses		
Contents	Courses	Code
<ul style="list-style-type: none"> • Ideal construction of abattoirs. Kinds of abattoirs. Essential requirements of abattoirs. Methods for enhancing the hygienic standards in abattoirs. 	Hygiene and management of abattoir and meat processing plants.	313-201E
<ul style="list-style-type: none"> • Types of meat by-product - Benefits of meat by-product. • Extraction and preparation of meat by-product- Poultry and fish by-product. 	Animal by-products.	313-202E
<ul style="list-style-type: none"> • Quality of meat and meat products - Diseases transmitted through meat and meat products - Testing of meat and meat products 	Meat borne diseases.	313-203E
<ul style="list-style-type: none"> • Sources – Types - Traditional techniques for detection - Recent techniques for detection 	Meat residues.	313-204E
<ul style="list-style-type: none"> • Physical means of Preservation (chilling-freezing-drying-canning-irradiation). Chemical means of Preservation (salting- pickling- addition of antibiotics) 	Preservation of meat, poultry and fish and their products.	313-205E
16- Hygiene Control of Milk and Milk products		
Elective Courses		
Contents	Courses	Code
<ul style="list-style-type: none"> • Bacterial food poisoning - Viral food poisoning - Mycotic food poisoning - Parasitic food poisoning- Chemical food poisoning - Vegetable food poisoning 	Food poisoning	313-206E
<p>Sampling - Chemical composition - Common pathogens - National and international standards - Chemical analysis- Microbial analysis</p>	Chemistry and analysis of milk, eggs and their products	313-207E
<ul style="list-style-type: none"> • Classification of food borne pathogens - Sources of contamination - Optimum condition for growth • Prevention and control- Isolation of food borne pathogens from food 	Food borne pathogens	313-208E
<ul style="list-style-type: none"> • Impact of mastitis - Causative organisms of subclinical mastitis - Field tests for detection of subclinical mastitis - Laboratory tests for detection of subclinical mastitis - Modern methods for detection of subclinical mastitis - Control of mastitis 	Detection of subclinical mastitis	313-209E
<ul style="list-style-type: none"> • Factors affecting microbial growth - Sources of contamination of food of animal origin- Spoilage microorganisms - Fermentation - Determination of bacterial count in food- Detection of fecal pollution in food - Examination of food for some pathogens 	Food microbiology	313-210E
17- Clinical Pathology		
Elective Courses		

Contents	Courses	Code
<ul style="list-style-type: none"> Abnormalities of erthrogram, leukogram and platelets of fish - disturbances of blood chemistry in fishes - evaluation of organ functions tests of fish 	Clinical pathology of fish	314-201E
<ul style="list-style-type: none"> Abnormalities of erthrogram, leukogram and platelets of poultry - disturbances of blood chemistry in poultry - evaluation of organ functions tests of poultry- examination of avian dropping 	Clinical pathology of poultry	314-202E
<ul style="list-style-type: none"> Abnormalities of erthrogram, leukogram and platelets of farm animal- disturbances of blood chemistry in farm animal diseases - evaluation of organ functions tests in farm animal diseases 	Laboratory clinical diagnosis of farm animal disease	314-203E
<ul style="list-style-type: none"> Abnormalities of erthrogram, leukogram and platelets in pet animals and ornamental birds - disturbances of blood chemistry in pet animals and ornamental birds - evaluation of organ functions tests of pet animals and ornamental birds 	Clinical pathology of pet animals and ornamental birds	314-204E
<ul style="list-style-type: none"> Collection of specimens- examination methods of parasitic infestation <ul style="list-style-type: none"> 3.hematological changes in parasitic diseases 4.local and systemic immune response in parasitic diseases 	Clinical pathology of parasitic disease.	314-205E
<ul style="list-style-type: none"> Collection of specimens- hematological changes in bacterial infections- immunoglobulins – anemia -antimicrobial sensitivity test - Diagnosis of mastitis 	Clinical pathology of bacterial disease.	314-206E

18- Fish Diseases

Elective Courses

Contents	Courses	Code
<ul style="list-style-type: none"> Studies on ichthiology and fish taxonomy as well as the anatomical, physiological and behavioural differences among fish species 	Fish Biology	315-201E
<ul style="list-style-type: none"> Deficiency of carbohydrates, proteins, lipids, minerals and vitamins in cultured fish 	Nutritional deficiency diseases of fish	315-202E
<ul style="list-style-type: none"> Gram-negative, Gram- positive, acid fast and non-acid fast bacteria affecting cultured and wild fish 	Bacterial fish diseases diagnosis and control	315-203E
<ul style="list-style-type: none"> The Chemical, Biological and Physical water pollutants and toxicants producing disease problems in cultured and wild fish 	Water environment pollutants	315-204E

19- Infectious Diseases

Elective Courses

Contents	Courses	Code
<ul style="list-style-type: none"> Viral diseases of buffaloes - bacterial diseases of buffaloes parasitic diseases of buffaloes - mycotic diseases of buffaloes 	Infectious diseases of Buffaloes	316-201E
<ul style="list-style-type: none"> Viral diseases of cattle - bacterial diseases of cattle parasitic diseases of cattle - mycotic diseases of cattle 	Infectious diseases of cattle	316-202E

<ul style="list-style-type: none"> • Viral diseases of camels - bacterial diseases of camels - parasitic diseases of camels- Mycotic diseases of camels 	Infectious diseases of camel	316-203E
<ul style="list-style-type: none"> • Viral diseases of sheep and goats - bacterial diseases of sheep and goats - parasitic diseases of sheep and goats - mycotic diseases of sheep and goats 	Infectious diseases of sheep and goats	316-204E
<ul style="list-style-type: none"> • Viral diseases of equine - bacterial diseases of equine • parasitic diseases of equine - mycotic diseases of equine 	Infectious diseases of equine	316-205E

20- Internal Medicine

Elective Courses

Contents	Courses	Code
<ul style="list-style-type: none"> • Studying the advanced tools as ultrasonography in diagnosis of animal diseases 	Ultrasound diagnosis of internal diseases	316-207E
<ul style="list-style-type: none"> • Studying the advanced tools as endoscope in diagnosis of animal diseases 	Laparoscopic diagnosis of internal diseases	316-208E
<ul style="list-style-type: none"> • Studying the general signs of animal diseases as Variation in body temperature, Disturbance of body fluids and electrolytes, Disturbance in acid base balance 	Field diagnosis of internal diseases	316-209E
<ul style="list-style-type: none"> • Studying the diagnosis of nutritional deficiency diseases caused by nutritional deficiency of trace and major elements, water and fat soluble vitamins, energy and protein 	nutritional deficiency diseases	316-210E

21- Veterinary Surgery

Elective Courses

Contents	Courses	Code
<ul style="list-style-type: none"> • Pre-anaesthetic medications - Local anaesthesia, Regional anaesthesia, General anaesthesia - Anaesthetic emergencies and accidents 	Anesthesia	317-201E
<ul style="list-style-type: none"> • X-rays and their behavior - The X-ray equipment - Types of X-ray Apparatus - Physics and instrumentations of ultrasonography - 	Diagnostic Imaging	317-202E
<ul style="list-style-type: none"> • Localized surgical affection -Hemorrhage and haemostasis- Affection of skin- Affections of bursae, cysts, tumors, hernias -Surgical disorders of body regions -Affection of lymphatic system, affection of muscles 	General Surgery	317-203E
<ul style="list-style-type: none"> • Ophthalmology - Ear and horn affections - Respiratory system surgical affections- Digestive system surgical affections- Urogenital systems surgical affections -mammary gland surgery 	Special Surgery	317-204E

<ul style="list-style-type: none"> • Eyelids, nasolacrimal system, conjunctiva, cornea, anterior chamber, uveal tract, lens, vitreous body, retina and choroid, optic nerve, glaucoma, globe and orbit 	Ophthalmology	317-205E
<ul style="list-style-type: none"> • The ear (pinna (ear flap or auricula) , ear canal, middle ear) - Nostrils and nasal cavity Intranasal Neoplasia , Epistaxis (Rhinorrhagia), Parasites of the nasal cavity, Fracture of the nasal bones, Atheroma, paranasal sinuses (Sinusitis, Trephination, Maxillary Cysts)- Larynx (Laryngeal Hemiplegia (roaring), Ventriculectomy, Empyema of the guttural pouch) 	Ear, Nose and Throat Surgery	317-206E
<ul style="list-style-type: none"> • Oral cavity and Tongue affection - Teeth affection - Foreign bodies in the pharynx, Surgical Disorders of salivary glands, esophagus, stomach, rumen, Abomasal displacement, small intestine 	Digestive System Surgery	317-207E
<ul style="list-style-type: none"> • Urogenital systems surgical affections 	Urogenital System Surgery	317-208E

22- Theriogenology

Elective Courses

Contents	Courses	Code
<ul style="list-style-type: none"> • Disturbances arising from fetal membranes, foetus and mother during pregnancy in ruminants - Normal and abnormal parturition in ruminants - Normal and abnormal puerperium in ruminants - Controlled reproduction in ruminant females - Causes of female infertility in ruminant females 	Obstetrics and reproduction in ruminants	318-201E
<ul style="list-style-type: none"> • Diagnosis and treatment of pregnancy-associated problems in equines - Normal and abnormal parturition in equines - Normal and abnormal puerperium in equines - Breeding management in equines - Controlled reproduction in equine females - Causes of infertility in equine females. 	Obstetrics and reproduction in equines	318-202E
<ul style="list-style-type: none"> • Normal pregnancy, contraception and pregnancy termination in pets - Normal and abnormal (dystocia) parturition in pet animals - Normal and abnormal puerperium in pet animals - Breeding management in bitch and queens- Causes of infertility in bitches and queens. 	Obstetrics and reproduction in pet animals	318-203E
<ul style="list-style-type: none"> • Reproductive pattern and management in male animals- Sexual behavior in males- Forms of infertility in males- Breeding soundness examinations in different male animals 	Reproduction and infertility in male animals	318-204E
<ul style="list-style-type: none"> • Semen collection and evaluation in farm animals • Sperm morphology and semen biochemistry in farm animals- 	Artificial insemination in farm animals	318-205E

Semen dilution and processing in farm animals - Techniques of AI in farm animals. • Technology of sexed semen in bovines.		
• Protocols of embryo transfer in farm animals - IVM, IVF and associated techniques in farm animals - Preservation of embryos in farm animals - Thawing and transfer techniques of embryos in farm animals.	Embryo transfer and in vitro production of embryos in farm animals	318-206E
• Collection and evaluation of semen in pet animals • Semen processing in pet animals - Insemination techniques in pet animals- Embryo transfer in pet animals - In vitro production of embryos and associated techniques in Pets.	Artificial insemination and embryo transfer in pet animals	318-207E

23- Animal and Poultry Behavior and Management

Elective Courses

Contents	Courses	Code
<ul style="list-style-type: none"> • Identification of ruminant- Definition of ruminant common terms - Behavior of cattle and Buffaloes • Management of cattle and Buffaloes - Behavior of sheep and Goat - Management of sheep and Goat <ul style="list-style-type: none"> • Behavior of camel - Management of camel 	Behavior and management of ruminant	319-201E
<ul style="list-style-type: none"> • Definition of poultry and rabbits common terms- Behavior and management of fowl- Behavior and management of turkey- Behavior and management of quails and pigeon- Behavior and management of ostrich- Behavior and management of rabbits- Identification of poultry and rabbits 	Behavior and management of rabbits and poultry	319-202E
<ul style="list-style-type: none"> • General and Patterns of behavior of equine - Breeds of equine- Definition of equine common terms - Description and identification of equine- management of Equine-Vices of equine 	Behavior and management of equine	319-203E
<ul style="list-style-type: none"> • Patterns of behavior of Fish- Feeding behavior of Fish - Reproductive behavior of Fish- Communication of Fish- Principles of Pond – construction- Factors affecting fish performance 	Behavior and management of fish	319-204E
<ul style="list-style-type: none"> • General Ethology - Identification of pets • Definition of pets common terms - Behavior and management of dogs - Behavior and management of cats - Abnormal behavior of pets 	Behavior and management of pets and lab animals	319-205E
<ul style="list-style-type: none"> • General and Patterns of behavior of Wild animals and Parakeets -Breeds of Wild Animals and Parakeets - Definition of Wild Animals and Parakeets common terms- Description and identification of Wild Animals and Parakeets - Management of Wild Animals and Parakeets- Vices of Wild Animals and Parakeets 	Behavior and management of wild animals and parakeets	319-206E

24- Animal, poultry and environment hygiene

Elective Courses

Contents	Courses	Code
<ul style="list-style-type: none"> • Classification of insecticides • Insecticides used in veterinary fields • Precautions of using insecticides • Hygienic disposal of insecticide residues 	Insecticides and Public Health	319-207E
<ul style="list-style-type: none"> • Types of disinfection- 	Disinfectants and Disinfection	319-208E

<ul style="list-style-type: none"> • Mode of action of disinfection • Hygienic disposal of disinfectant residues 		
<ul style="list-style-type: none"> • Types of animal wastes • Characterization of animal and poultry wastes • Methods of treatment of animal wastes 	Hygienic treatment of animal wastes	319-209E
<ul style="list-style-type: none"> • Biosecurity definitions and measures • Assessment of biosecurity programs in different establishments 	Biosecurity of poultry and animal farms	319-210E
<ul style="list-style-type: none"> • Sources and causes of water and air pollution • Classification and types of air and water pollutants • Methods of treatment of polluted water 	Air and water Hygiene and pollution	319-211E

25- Zoonoses

Elective Courses

Contents	Courses	Code
<ul style="list-style-type: none"> • Viroses of Farm animals, Bacterioses of Farm animals, Parasitioses of Farm animals, Mycoses of Farm animals and Rickettsioses of Farm animals. 	Farm animals Zoonoses	319-212E
<ul style="list-style-type: none"> • Viroses of pet animals, Bacterioses of pet animals, Parasitioses of pet animals, Mycoses of pet animals and Rickettsioses of pet animals. 	Pet animals Zoonoses	319-213E
<ul style="list-style-type: none"> • Viroses of birds, Bacterioses of birds, Parasitioses of birds, Mycoses of birds, Rickettsioses of birds and role of wild and migratory birds in spread of zoonoses. 	Birds Zoonoses	319-214E
<ul style="list-style-type: none"> • Marine water fish zoonoses, Fresh water fish zoonoses, Toxic fish zoonoses, Crustaceans zoonoses, Aquatic animal's zoonoses. 	Fish and Aquatic animals Zoonoses	319-215E
<ul style="list-style-type: none"> • Viroses of wild animal, Bacterioses of wild animal, Parasitioses of wild animal, Mycoses wild animal and Rickettsioses of wild animal. 	Wild animals Zoonoses	319-216E

Poultry Diseases

Elective Courses

Contents	Courses	Code
<ul style="list-style-type: none"> • ND- AI-IB-ILT- IBD-REO viruses-Adeno viruses-Pox- Entero viruses-Duck viral Diseases-neoplastic diseases 	Viral diseases of Poultry	320-201E
<ul style="list-style-type: none"> • Salmonella- E coli- Fowl Cholera- ORT- Clostridia-Infectious Coryza- 	Bacterial diseases of Poultry	320-202E
<ul style="list-style-type: none"> • Aspergillosis- Candidiasis- Avian ring worm- Avian Mycotoxicosis 	Mycotic diseases of Poultry	320-203E
<ul style="list-style-type: none"> • Protozoa infection - Trematodes-Cestodes – Nematodes- Endoparasitic 	Parasitic diseases of Poultry Parasitic diseases of Poultry	320-204E
<ul style="list-style-type: none"> • Vit. A deficiency- Vit. E deficiency- Vit. D deficiency- Vit. B deficiency- Vit. K deficiency – Colin deficiency race element deficiency 	Nutritional deficiency diseases of Poultry	320-205E
<ul style="list-style-type: none"> • Viral Diseases – Bacterial Diseases- Parasitic Diseases 	Rabbit Diseases	320-206E

