

**DIPLOMA IN ANIMAL HUSBANDRY & DAIRYING( DAHD) SEMESTER WISE COURSE &  
CREDIT HOURS DISTRIBUTION  
(Total duration 2 years)**

| Title of Subject   | <i>Subject Code</i> | <i>Credits Hours<br/>( Th + Pr )</i> |
|--|---------------------|--------------------------------------|
| <b>SEMESTER - I</b>  |                     | <b>( 13 + 7 = 20 )</b>               |
| Paper-I : General Livestock Management                                     | D - AH - 111        | 2 + 1                                |
| Paper-II : Fundamentals of Veterinary Physiology                           | D - AP - 111        | 2 + 1                                |
| Paper-III : Nutrients, Feeds and Feeding of Farm Animals                   | D - AN - 111        | 2 + 1                                |
| Paper-IV : Introduction to Forage Crop Production                          | D - FP - 111        | 1 + 1                                |
| Paper-V : Pig, poultry, goat and sheep husbandry                           | D - AH - 112        | 2 + 1                                |
| Paper VI : Introduction to Computer Application                            | D - CS - 111        | 2 + 1                                |
| Paper VII : Introduction to Health Management                              | D - AH - 114        | 2 + 1                                |
| Physical Education ( NON CREDIT )  | D - PE - 101        | 0 + 1                                |
| <b>SEMESTER - II</b>   |                     | <b>( 12 + 7 = 19 )</b>               |
| Paper-I : Production and Shelter Management of Livestock                   | D - AH - 121        | 2 + 1                                |
| Paper-II : Digestion, Absorption and Metabolism of Nutrients               | D - AN - 121        | 2 + 1                                |
| Paper-III : Physiology of Reproduction & Lactation                         | D - AP - 121        | 2 + 1                                |
| Paper-IV : Introductory Animal Genetics and Breeding                       | D - AGB - 121       | 2 + 1                                |
| Paper-V : Forage Crop Production   | D - FP - 121        | 1 + 1                                |
| Paper VI : Animal Husbandry Extension                                      | D - AHE - 121       | 2 + 1                                |
| Paper VII : Artificial Insemination in Farm Animals                        | D - AH - 122        | 1 + 1                                |
| Physical Education ( NON CREDIT )  | D - PE - 102        | 0 + 1                                |
| Hindi ( NON CREDIT )   | D - HI - 102        | 1 + 0                                |
| <b>SEMESTER - III</b>  |                     | <b>( 13 + 7 = 20 )</b>               |
| Paper-I : Health Management in Farm Animals                                | D - AH - 211        | 2 + 1                                |
| Paper-II : Applied Animal Nutrition  | D - AN - 211        | 2 + 1                                |
| Paper-III : Basics of Milk Processing                                      | D - DT - 211        | 1 + 1                                |
| Paper-IV : Farm Economics and Marketing                                    | D - FE - 211        | 2 + 1                                |
| Paper-V : Introduction to Applied Animal Biotechnology                     | D - BT - 211        | 2 + 1                                |
| Paper VI : Reproductive Management in Farm Animals                         | D - AH - 212        | 2 + 1                                |
| Paper VII : English Communication, Soft Skills & Personality Development   | D - ENG - 211       | 2 + 1                                |
| Physical Education ( NON CREDIT )  | D - PE - 201        | 0 + 1                                |
| <b>SEMESTER - IV</b>   |                     | <b>( 8 + 12 = 20 )</b>               |
| Paper I : Introductory Pharmacy  | D - AH - 321        | 3 + 1                                |
| Paper II : Elementary Medicine   | D - AH - 322        | 3 + 1                                |
| Paper – III : Introduction to Surgical Procedures                          | D - AH - 323        | 2 + 1                                |
| Paper – IV : Introduction to clinical procedures and animal farm practices | D - AH - 324        | 0 + 9                                |

## **Semester wise course & Syllabus**

### **Semester – I**

#### **Paper – I: General Livestock Management**

**Subject Code: - D - AH – 111**

**Credits Hours ( T + P ) : - ( 2 + 1 )**

##### ***Theory***

Introductory animal husbandry. Common animal husbandry terms. Common farm management practices including disinfection, isolation, quarantine and disposal of carcass. Identification of animals by colours and marks. Handling, restraining and casting of animals. Judging and culling criteria.

Routine management practices like grooming, washing, dipping, shearing and exercising. Common vices of animals, their prevention and care. Routine dairy farm operations. Determination of age by dentition, Body Weight determination of animals.

##### ***Practical***

Familiarization with body points/parts of animals. Approaching, handling and restraining of animals. Detection of vices. Methods of identification (marking, tattooing, branding, tagging and electronic chip). Determination of age. Determination of body weight using different measurements.

Preparation of animals for show and judging. Familiarization with routine farm operations. Methods of disbudding. Record keeping.

#### **Paper–II: Fundamentals of Veterinary Physiology**

**Subject Code: - D - AP – 111**

**Credits Hours ( T + P ) : - ( 2 + 1 )**

##### ***Theory***

Structures and Functions of Animal: Tissues; Elementary knowledge of morphology, anatomy and functions of different systems. Basic osteology of ruminant and non-ruminant livestock species, Physiology of muscles, General Physiology and Biochemistry of body fluids and digestive system, digestive glands e.g. salivary glands, gall bladder, pancreas and their functions. General Physiology and Biochemistry of respiratory and circulatory system, basic knowledge on excretory system

##### ***Practical***

Collection of blood from farm animals, Measurement of body temperature, pulse and heart rate, Study on Animal Hematogram

#### **Paper–III: Nutrients, Feeds and Feeding of Farm Animals**

**Subject Code: - D - AN -111**

**Credits Hours ( T + P ) : - ( 2 + 1 )**

##### ***Theory***

Components of Plants and Animals, Role of Water, Carbohydrate, Lipid and Protein in Animal Nutrition, Physiological Functions and Deficiency Symptoms of minerals and Vitamins. Classification of Feeds and Fodder, Dry Roughages, Green Fodder, Concentrate Ingredients, Feed Supplements, Additives & Implants, Non Conventional Feed Resources, Agro Industrial By products, Tree Fodder, Aquatic fodder, Methods of Nutritional Evaluation of Feed

##### ***Practical***

Preparation of chart/write up/presentation on sources, physiological functions and deficiency symptoms of carbohydrates, proteins and fat, essential minerals and vitamins, Identification of sources of different nutrients. Identification of feeds and fodder, Collection and processing of samples of feed and fodder, Proximate evaluation of feeds and fodder in terms of DM, OM, CP, EE, NFE, Total Ash. Demonstration of Mineral Estimation

#### **Paper–IV: Introduction of Forage Crop production**

**Subject Code: - D - FP - 111**

**Credits Hours ( T + P ) : - ( 1 + 1 )**

##### ***Theory:***

Definition of Forage Crops. Importance of forage crops in animal nutrition. Classification of forage crops. Systems of forage crop production. Brief introduction to influence of climate on crop growth and production. Soil fertility and soil productivity. Soil texture and soil structure. Soil pH. Brief introduction to plant mineral nutrition and manures and fertilizers. Cultivation of cereal forage crops. Cultivation of ground leguminous forage crops. Cultivation of grasses. Brief introduction to agricultural tools and machineries used for crop production, harvesting and processing. Concept of green and dry fodders. Relative nutritional status of different forage crops in different stages of growth. Concept of carrying capacity of field.

**Practical:**

Identification of fodder crops and seeds-Visit to fodder crop fields.Observations of different agricultural field operations for crop production-land preparations, sowing, manuring and fertilizer applications, intercultural operations, irrigations, harvesting and feeding to the animals.Calculations of doses of seeds, fertilizers, pesticides.Identifications of different agricultural tools and machineries used for crop production and harvesting and processing.Calculations of cost of cultivation of fodder crops.Demonstrations of urea treatment of paddy straw.Preparation of Herbarium on forage crops.

**Paper-V: Pig, poultry, goat and sheep husbandry****Subject Code: - D - AH – 112                      Credits Hours ( T + P ) : - ( 2 + 1 )****Theory**

Breeds of pig, goat and sheep; Space requirement and housing ; Feeds and feeding management; vaccination, deworming and health and reproductive management; Commercial strains of Broilers; starter and grower mash – nutritive value, feed formulation, and preparation; Deep litter rearing; vaccination, health management and marketing; Commercial strains of Layer, housing, feeds and feeding management; vaccination, deworming and health management of brooder, grower and layer; Egg collection and grading, marketing; factors affecting egg production; Cannibalism; summer stress and its management in poultry birds; debeaking; hatchery operations

**Practical**

observations on day to day managerial operations in piggery, goater, broiler and layer farming. Calculation of economics of goater, piggery and poultry rearing; exposure to hatchery management operations

**Paper VI: Introduction to Computer Application****Subject Code: - D - CS – 111                      Credits Hours ( T + P ) : - ( 2 + 1 )****Theory**

Introduction to Computers, Hardware and software concepts, Basic applications of computer, Introduction about Operating Systems, Programming languages. Introduction to commonly used MS Office application softwares – MS Word, Power Point, Excel. Concept of Internet; Applications of Internet; Connecting to Internet; World Wide Web (WWW); Web Browsing softwares, Search Engines; Understanding URL; Domain name; IP Address. Basics of Electronic mail;

**Practical**

Understanding the Parts and Components of Computers. Use of word processing software for creating reports and presentation.Use of Power point presentation software for creating reports and presentation.Use of Excel software for entering data and presentation.Exploring the Internet: Web Browsing/ Searching etc. Preparation and presentation of Multimedia files.

**Paper VII: Introduction to Health Management****Subject Code: - D - AH – 114                      Credits Hours ( T + P ) : - ( 2 + 1 )****Theory**

Clinical examination of sick animal, Signs of health and disease in different animals, Significance of Temperature, Respiration and Pulse in animals, Care of sick animals and care of neonates. Etiology, symptoms, treatment, prevention and control of some major diseases of livestock.Anthelmintics, deworming schedule, vaccination schedule, castration in farm animals, introduction to mastitis and its management

**Practical**

Clinical Attendance, Administration of drugs, care and management of sick indoor and outdoor animals, Diagnoses of the disease by recording symptoms, temperature, pulse, respiration, Cleansing & sterilization of surgical items. Different staining methods.

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## Semester – II

### **Paper–I: Production and Shelter Management of Livestock**

**Subject Code: - D - AH – 121      Credits Hours ( T + P ) : - ( 2 + 1 )**

#### **Theory**

Management of animals - during and after parturition, and post –parturient care. Nursing care of neonate before and after birth, Milking management, methods of milking and precautions. Factors affecting quality and quantity of milk production. Clean milk production. General principles affecting the design and construction of building for housing for various livestock species. Space requirement for livestock. Construction of animal housing utilizing local resources. Automation in livestock farming. Disposal of animal wastes under urban and rural conditions. Hygiene and sanitation on animal farm.

#### **Practical**

Milking of farm animals. Disinfection of animal house and milking utensils, Visit to different animal farms/ demonstration centres/ individual rural, urban and peri-urban animal units. Layout plans for dairy and sheep/goat/pig farms.

### **Paper–II: Digestion, Absorption and Metabolism of Nutrients**

**Subject Code: - D - AN – 121      Credits Hours ( T + P ) : - ( 2 + 1 )**

#### **Theory**

Ruminant and non-ruminant digestive system, Factors affecting rumen development, Microbial ecology of the rumen, Digestive enzymes; Digestion, absorption and metabolism of carbohydrate, protein and fat in ruminant and mono-gastric animals, Essential amino-acids and Essential fatty-acids: their role in animal nutrition, Anti-nutrients, Metabolic Disorders.

#### **Practical**

Estimation of fiber components (Neutral Detergent Fiber, Acid Detergent Fiber, Acid Insoluble Ash etc.) in Feed, Estimation of pH in rumen liquor, VFA estimation in rumen liquor, NH<sub>3</sub>-N estimation in rumen liquor, Staining and counting of rumen protozoa, Demonstration of estimation of in vitro dry matter degradability and in vitro gas production technique for feed evaluation.

### **Paper–III: Physiology of Reproduction & Lactation**

**Subject Code: - D - AP – 121      Credits Hours ( T + P ) : - ( 2 + 1 )**

#### **Theory**

General Endocrinology, Different kinds of hormones, secretion, functions etc. Female Reproductive Physiology: Puberty, oogenesis ovulation, formation of corpus luteum, estrous cycle and parturition; Male Reproductive Physiology: Erection, ejaculation, male hormones, factors affecting working of testis, spermatogenesis, spermatozoa Lactation Physiology - Structure of udder, milk secretion, galactopoesis, letdown of milk, formation of colostrum, milk fat and milk protein,agalactia.

#### **Practical**

Physiological assessment of Farm animals, Physiological assessment of different reproductive organs, Estimation of hormones, Physiology of milk letdown, Somatic Cell Count in milk

### **Paper–IV: Introductory Animal Genetics and Breeding**

**Subject Code: - D - AGB – 121      Credits Hours ( T + P ) : - ( 2 + 1 )**

#### **Theory:**

Basic concept of Quantitative and Qualitative Genetics. Mendel's classical genetics and its principle, Physical basic of inheritance, Heredity-its definition, classification etc. Chromosome morphology, System of mating, Concepts of Heritability and Repeatability, Selection- definition, methods, Breeding value, Importance and maintenance of different farm records etc.

#### **Practical:**

Practical aspects on mono and di-hybrid crosses, blood group data. Calculation of gene and genotype frequencies, Estimation of genotypic and phenotypic parameters, Estimation of coefficient of inbreeding and relationship, etc.

**Paper–V: Forage Crop Production**

**Subject Code: - D - FP - 121 Credits Hours ( T + P ) : - ( 1 + 1 )**

**Theory:**

Brief introduction to the weeds, insect pests, diseases prevalent in fodder crops and management practices to reduce the damage potentials . Fodder trees and shrubs. Pasture crops. Introduction to the use of biofertilizers in crop production.Preservation of forage crops- hay and silage preparations.*Azolla* production.Vermicomposting.

**Practical:**

Visit to fodder tree/shrub/pasture crop fields. Preparation of Herbarium on fodder trees/shrubs/pasture crops & weeds found in agricultural crop fields. Project/Demonstration on *Azolla* Production, Vermicomposting. Demonstration of preservation of surplus forage crops as hay and silage. Region specific fodder crop calendar preparation. Preparation of fodder crop calendar and scheme for a given dairy farm

**Paper - VI: Animal Husbandry Extension**

**Subject Code: - D - AHE – 121 Credits Hours ( T + P ) : - ( 2 + 1 )**

**Theory**

Basics of Extension education, its meaning, Scope & objective, Rural Sociology & its importance to the extension workers, Audio-Visual aids, Animal husbandry awareness programmes: Meeting, Seminars and Camps etc., Adoption and communication of innovation

**Practical**

Preparation of model, Chart, & different audio- Visual programmes, Visit to KrishiMela , exhibition stalls, Animal husbandry awareness programmes in villages, Different techniques of PRA- Transect walk, Resource map, Agro-ecological map, mobility map, Preparation of extension materials to organise Deworming, Vaccination, Infertility camps etc. in villages

**Paper VII: Artificial Insemination in Farm Animals**

**Subject Code: - D - AH – 122 Credits Hours ( T + P ) : - ( 1 + 1 )**

**Theory**

Semen collection in farm animals- different methods and their advantages, Evaluation of semen for quality parameters, Preservation of semen - different methods, extenders and storage temperature, Cryobiology of semen preservation, Functional anatomy of reproductive organs in farm animals.Estrus detection methods, synchronization of estrus cycle and fixed time AI, Methods of pregnancy diagnosis

**Practical**

Evaluation of frozen thawed semen for motility parameters, Assessment of sperm morphology and abnormal counts, Estimation of sperm cell concentration, Assessment of sperm cell viability, Estimation of functional membrane integrity, Preparation of semen extenders, Artificial insemination

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**Semester – III**

**Paper–I: Health Management in Farm Animals**

**Subject Code: - D - AH – 211 Credits Hours ( T + P ) : - ( 2 + 1 )**

**Theory**

Brief account on Parasitic diseases (internal and external). Wound types and management, use of different antiseptics, Etiology, symptoms, treatment prevention and control of major infectious diseases of farm animals. Poisons (types, effects, treatment, etc.) - Arsenic, lead, cyanide, nitrate, nitrite, etc.

**Practical**

Method of collection and examination of blood, faeces, urine, milk from animals for laboratory diagnosis. Collection of blood samples and Separation of serum and plasma from blood. Preparation of blood smears and Microscopic examinations for laboratory diagnosis.Different methods of administration of vaccines in animals.

**Paper-II: Applied Animal Nutrition**

**Subject Code: - D - AN – 211**

**Credits Hours ( T + P ) : - ( 2 + 1 )**

**Theory**

Nutrient Requirements & Feeding Standards, Nutritive Value of Feeds and Fodder, Mineral Mixture, Ration Formulation for different Species of Farm Animals, Feed Processing, Silage Making, Hay Making, Nutritional enrichment of Fibrous crop Residue, Utilization of non protein nitrogenous (NPN) compound in ruminant diet, Bypass Protein and Fat, Scarcity Feeding.

**Practical**

Formulation of rations for different categories of animals, Urea treatment of Straw, Concentrate mixture preparation

**Paper-III: Basics of Milk Processing**

**Subject Code: - D - DT – 211**

**Credits Hours ( T + P ) : - ( 1 + 1 )**

**Theory**

Different kind of milk and milk products, Indian Standards, Composition, Factors affecting composition of milk, Food and nutritive value, Physio-chemical properties of milk & milk constituent, Microbiology of milk, Milk and public health, Buying and collection of milk, Cooling and transportation of milk, Action of milk on metal, Cleaning and sanitization of dairy equipments, Judging and grading of milk, Flavour defects in milk their causes and prevention. Uses of milk.

**Practical**

Acquaintance with apparatus and glass ware, Preparation of acid solutions, Estimation of fat, SNF and Total Solids, Separation of cream using cream separator, Estimation of fat and SNF of skim milk and cream. Visit to dairy plants for knowing the operation of the plants for different product manufacture.

**Paper-IV: Farm Economics and Marketing**

**Subject Code: - D - FE – 211**

**Credits Hours ( T + P ) : - ( 2 + 1 )**

**Theory**

Economics: Definition, Microeconomics, Macroeconomics; Farm Economics: Definition, Type of Farm, Farm Resources: Land, Cattle Shed, Milch Animals, Implements, Labour and Capital, Cost Concept: Fixed Cost, Variable Cost, Cost Benefit Analysis, Farm Planning: Definition, Farm Budget, Accounts and Book Keeping, Market: Definition, Market Agents, Type of Market, Market Channel, Price analysis and Market Cost.

**Practical**

Farm Planning and Budgeting, Cost Benefit analysis, Record keeping, Cost concepts

**Paper-V: Introduction to Applied Animal Biotechnology**

**Subject Code: - D - BT – 211**

**Credits Hours ( T + P ) : - ( 2 + 1 )**

**Theory**

Introduction to gametes (oocytes and sperms), Female reproductive system, Fertilization process (In vivo and in vitro) and early embryonic development, Sexing of sperms/embryos and its application in livestock, Application of cloning, transgenesis and stem cells in livestock development.

**Practical**

Isolation and grading of immature oocytes from cattle ovaries, In vitro Maturation of oocytes, In vitro sperms capacitation and In vitro fertilization of oocytes.

**Paper VI: Reproductive Management in Farm Animals**

**Subject Code: - D - AH – 212**

**Credits Hours ( T + P ) : - ( 2 + 1 )**

**Theory**

Parturition and care of parturient cows, Dystocia, uterine torsion, uterine prolapse, retention of foetal membranes, metritis-causes and their management, Infertility and its management, economic losses due to infertility, Anoestrus and other functional causes of infertility, Repeat breeder cow – causes and management.

**Practical**

Examination genital organs- slaughter house specimen, Rectal examination of reproductive organs in dairy cows, White side test, Estrus detection,

**Paper VII :English Communication, Soft Skills & Personality Development**

**Subject Code: - D - ENG – 211Credits Hours ( T + P ) : - ( 2 + 1)**

**Theory**

Parts of Speech. Correct Usages. Composition - Case Writing & Letter Writing. Précis Writing. Essay Writing, Group dynamics and Team work

**Practical :**

Public Speaking ,Extempore, Debate, Group discussion, Mock Interview.

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**Semester – IV**

**Paper I :Introductory Pharmacy**

**Subject Code: - D - AH – 321**

**Credits Hours ( T + P ) : - ( 3 + 1)**

**Theory**

Definitions of terms: Pharmacology, Pharmacy, Chemotherapy, Therapeutics, Toxicology, Posology, Metrology etc. Sources and nature of drugs ; Routine Pharmaceutical processes ; Various dosage forms with suitable examples ; Principles of compounding and dispensing of drug preparations ; Different methods for the administration of drugs ; Pharmacy weights and measures- Apothecary & metric system; Household measures ; Prescription reading- parts of prescription and commonly used Latin abbreviations in prescription writing ; Broad therapeutic classification of drugs employed in Vety. Practice- Definitions examples and therapeutic uses in animals.

**Practical**

Identification of common drugs; Labeling and storage of common drugs: Compounding and dispensing of pharmacy preparations.

**Paper II :Elementary Medicine**

**Subject Code: - D - AH – 322Credits Hours ( T + P ) : - ( 3 + 1)**

**Theory**

Preliminary knowledge about signs of diseases; Clinical methods of examination and detection of abnormalities ; Abnormal body discharge ; Body temperature, pulse and respiration ; Methods of injecting drugs, sera, vaccine etc ; Use of canula, passing stomach tube, probang, teat syphon and other instruments for treatment ; General agents responsible for causing diseases: Bacteria, Viruses, Fungi and Parasites ; General principles of prevention and control of diseases ; Utilization and disposal of carcasses ; Elementary clinical diagnostic methods, history and general examination.

Non infectious diseases - symptoms and first aid of following diseases: Stomatitis, Choke, Upper respiratory tract infections, Tympany, Impaction, Constipation, Diarrhoea, Dysentery, Indigestion, Pneumonia, Haemoglobinuria, Milk fever, Ketosis, Pica. Common Infectious and parasitic diseases - Symptoms and first aid. Vaccination : Elementary Knowledge about vaccination of Domestic animals & Poultry.

**Practical**

Cleaning of slides, glass wares and other laboratory equipments ; Techniques of staining and preparation of blood smears ; Collection, processing for examination of blood, urine, faeces; Collection, preservation, fixation and dispatch of morbid material for laboratory examination; Treatment of different infectious and noninfectious diseases in the farm.

**Paper III :Introduction to Surgical Procedures**

**Subject Code: - D - AH – 323Credits Hours ( T + P ) : - ( 2 + 1)**

**Theory**

Introduction and common terms used in Surgery : Sterilization in surgical practice ; Introduction to superficial surgical ailments ( Abscess, Fistula, Sinus, Wounds, Gangrene Cyst ) ; Introduction to hoof management ; First aid management of fracture, bloat, haemorrhage ; Introduction to post operative management ; Application and uses of various antiseptics, lotions, ointments and tinctures in surgical practice.

**Practical**

Identifications of various surgical instruments ; Physical restraint of animals for surgery ; Various injections ; Burdizzo castration ; Preparing animals for surgery ; Application of counter irritants, heat, cold fomentation. Preparation of pack for autoclaving ; Surgical attires and their uses by the Surgeon ; Operation room discipline ; Dressing of wounds and bandages.

**Paper IV :Introduction to clinical procedures and animal farm practices**

**Subject Code: - D - AH – 324Credits Hours ( T + P ) : - (0 + 9)**

**Practical**

Recording of temperature, pulse and respiration ; Methods of drug administration ; Practice of compounding and dispensing of various drugs ; Intramammary infusions ; Dressing of wounds ; Acquaintance with various gynecological and surgical instruments with their uses : Sterilization of instruments etc. ; Demonstration of gynecological and surgical problems ; Preparation and handling of surgical pack ; Collection of clinical material for laboratory examination ; Burdizzo castration of calf, sheep and goat. Prophylaxis measure against common domestic animals & Poultry diseases.

Farm activities and farm routines followed in different livestock farms- cattle, sheep, goat, pig and poultry.

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