COURSE SYLLABUS
FOR
DIPLOMA IN ANIMAL HUSBANDRY

First Semester

Sr. no	Course No.	Title of the Course	Credit Old	Credit New
1.	LAN-111	Introductory Livestock Anatomy	3+1=4	2+1=3
2.	APHY-111	Introductory Animal Physiology	3+1=4	2+1=3
3.	LPM-111	Introductory Dairy Cattle and Buffalo Management	2+1=3	2+1=3
4.	ENG-111	English	2+1=3	2+1=3
5.	CA-111	Introduction to Computer Application	1+2=3	1+2=3
		Total	11+6=17	9+6=15

Second Semester

Sr. no	Course No.	Title of the Course	Old	New
1.	STAT-121	Elementary Statistics	2+1=3	1+1=2
2.	AN-121	Introductory Fodder Production and Grassland Management	1+1=2	1+1=2
3.	AB-121	Introductory Animal Breeding	1+1=2	1+1=2
4.	LPM-121	Introductory Sheep and Goat Management	2+1=3	2+1=3
5.	AHE-121	Introductory Animal Husbandry Extension-I	2+1=3	2+1=3
6.	ENVS-121	Introduction to Environmental Science	2+1=3	2+1=3
		Total	10+6=16	9+6=15

Third Semester

Sr. no	Course No.	Title of the Course	Old	New
1.	VMI-211	Introductory Veterinary Microbiology	2+1=3	2+1=3
2.	VPARA-211	Introductory Veterinary Parasitology	2+1=3	2+1=3
3.	VPA-211	Preliminary Pathology	2+1=3	2+1=3
4.	AHE-211	Introductory Animal Husbandry Extension-II	2+1=3	2+0=2
5.	AN-211	Introductory Animal Nutrition-I	1+1=2	1+1=2
		Total	9+5=14	9+4=13

Fourth Semester				
Sr. no	Course No.	Title of the Course	Old	New
1.	AHEM-221	Introductory Animal Husbandry Economics and Marketing	2+0=2	2+1=3
2.	AN-221	Introductory Animal Nutrition-II	1+1=2	1+1=2
3.	VP-221	Introductory Pharmacology	3+2=5	2+2=4
4.	AR-221	Artificial Insemination in Farm Animals	1+2=3	1+2=3
5.	AHC-221	Introductory Animal Health Care	2+2=4	3+1=4
		Total	9+7=16	9+7=16
Fifth Semester				
Sr. no	Course No.	Title of the Course	Old	New
1.	AR-311	Reproductions in Farm Animals	1+2=3	2+1=3
2.	VPH-311	Introductory Veterinary Public Health	2+2=4	2+1=3
3.	LPM-311	Introductory Poultry Management	2+1=3	2+1=3
4.	VSUR-311	Minor Veterinary Surgery	2+1=3	2+1=3
		Total	9+8=17	8+4=12
Sixth Semester (Farm Practice Training)				
		Total	0+15	0+15

- Cattle and buffalo farms
- Sheep and goat farms
- Poultry farm
- Veterinary College/Veterinary Clinical Complex (VCC)/ Livestock Farm Complex (LFC)
- Government dispensary/Co-operative dairy unit /Gaushala
- Seven days Educational tour
- Report Writing

Note: The maximum duration for each center should not exceed 03 weeks. The selection of center as per regulation for Farm Practice Training for Diploma in Animal Husbandry course, 2016 {Appendix-1 (A) point no.09}

Semester wise credits hours distributions

Credit hour means the weekly unit of work reorganization for particular course as per the Syllabus. A theory lecture class of one hour per week shall be counted as one credit hour where as a practical class of two or three hours durations per week shall be counted as one credit hour.

	Semester	Theory	Practical	Total Credit Hours
First Year	I	9	6	15
	II	9	6	15
Total				30
Second Year	I	9	4	13
	II	9	7	16
Total				29
Third Year	I	8	4	12
	II	0	15	15
Total				27
Grand Total				86

First Semester	
OLD SYLLABUS	**NEW PROPOSED SYLLABUS**
Course No. LAN-111: Introductory Livestock Anatomy **(Credit Hours: 3+1=4)** **Theory** Cell Structure, Tissue Structure, Study of bones - Glossary of osteology, Classification, work and identification of various bones of the body of cow, horse, dog, sheep, pig and poultry and comparison thereof. Study of joints and hinges of the body. Study of muscles and tendons of leg and neck. Study of skin and others e.g. epidermis, dermis, hypodermis, sweat glands of skin, horn, claws, chest nut etc. Digestive system - mouth, tonsils, pharynx, esophagus, ruminant and non-ruminant stomach, Small intestine, large intestine. Associated organs and digestive gland for digestion. Respiratory system- nostril, nasal cavity, sinus, pharynx, larynx, trachea, lungs, thorax, pleura. Circulatory system-heart, blood arteries, veins, portal circulation, foetal circulation, lymphatic system. Excretory system-Structure of kidney, ureter, bladder, urethra, working of kidneys, structure of nephrons, micturation etc. female genital system. male genital system – testis, scortum, epididymis, ductus deferens, penis, muscles, blood arteries, nerves related to genital system, accessory sex glands, secondary sex characters. Structure of udder. **Practical** Practical introductory study of following using charts, models and basis laboratory facilities: Cell structure, tissue structure .gross study of bones-identification of various bones of the body of cow, horse, dog, sheep, pig, and poultry and comparison thereof. gross study of joints and hinges of the body. Study of muscles and tendons of legs and neck. study of skin and others e.g. epidermis ,dermis ,hypodermis, sweat glands of skin, horn, claws, chest nut etc. gross study of	**Course No. LAN-111: Introductory Livestock Anatomy** **(Credit Hours: 2+1=3)** **Theory** • Brief study of bones- Glossary of osteology, Classification and identification of various bones of the body of cow, horse, dog and fowl. • Structure of Skin and its appendages (Includes Horn, Hoof, Claws and Nails). Introduction of joints and hinges of the body. • Gross anatomy of digestive system and associated glands in ruminants and non ruminants. • Gross anatomy of respiratory system in cow, horse, dog and fowl. • Brief introduction of circulatory system- systemic circulation, pulmonary circulation and foetal circulation. • Gross anatomy of excretory system in cow, horse, dog and fowl. • Gross anatomy of male and female reproductive system and accessory sex glands in cow, horse, dog and fowl. • Structure of udder. **Practical** • Identification of various bones of the body of cow, horse, dog and fowl. • Demonstration of various joints of the body. • Demonstration of various components of digestive system in ruminants and non-ruminants. • Demonstration of organs of respiratory system

digestive system- mouth, tonsils, pharynx, esophagus, ruminant and non ruminant stomach, small intestine, large intestine. Associated organs and digestive gland for digestion. Respiratory system-nostril, nasal cavity, sinus, pharynx, larynx, trachea, lungs, thorax, pleura. Gross study of circulatory system- heart, blood arteries, veins, portal circulation, foetal circulation, lymphatic system. Excretion system- Structure of kidney, ureter, bladder, urethra, working of kidneys, structure of nephrons, micturation, etc. gross study of female genital system- ovary, uterine tube, uterus, vagina, vulva, blood arteries and nerves related to genital system.Gross study of male genital system- testis, scrotum, epididymis, ductus deferens, penis, muscles, blood arteries, nerves related to genital system, accessory sex glands, secondary sex character. Gross study of structure of udder.	• Demonstration of structure of heart& Portal circulation. • Demonstration of organs of excretory system. • Demonstration of various organs of male and female genital system.
Course No. APHY-111: Introductory Animal Physiology **(Credit Hours: 3+1=4)** **Theory** General Physiology of muscles i.e. smooth, cardiac, voluntary striated muscle. General physiology of body fluids: Formation of blood cells, haemopoiesis, plasma, serum, blood PH, blood clot formation, various types of blood cells, lymph, cerebrospinal fluid, synovial fluid, serum, macrophages and immunity. General physiology of digestive system, prehension, mastication, swallowing, gastric movement ,physiology of small and large intestine, digestion in ruminants and non-ruminants and their comparative study, various enzymes used during digestion, absorption of feed ingredients, metabolism of protein, carbohydrate and fat. Digestive glands e.g. salivary glands, gall bladder, pancreas and their functions. General physiology of respiratory system- mechanism of respiration, respiratory action, dead space, artificial respiration, exchange of gases etc. general physiology of circulatory system Cardiac cycle, system of heart, nervous control of blood flow, shock (blood volume and pressure,) Venus and lymphatic return, theory of vaccination and immunity in animals. General Physiology of	**Course No. APHY-111: Introductory Animal Physiology** **(Credit Hours: 2+1=3)** **Theory** • General Physiology of cell, tissue and muscles. • General Physiology of body fluids: plasma, serum, blood PH, various types of blood cells, immunity. • General Physiology of digestive system, prehension, mastication, swallowing, gastric movement, physiology of small and large intestine, digestion in ruminants and non-ruminants and their comparative study, various enzymes used during digestion, absorption of feed ingredients. Digestive glands e.g. salivary glands, gall bladder, pancreas and their functions. • General Physiology of respiratory system- mechanism of respiration and exchange of gases etc. • General Physiology of circulatory system of heart, shock (blood volume and pressure) in animals. • General Physiology of urinary system physiology of kidney and nephron.

urinary system physiology of kidney and nephron. General physiology of female genital system-puberty, oogenesis ovulation, formation of corpus luteum, estrous cycle, hormones of female reproduction system, pregnancy and parturition. General physiology of male reproductive. system-Erection, ejaculation, hormones of male reproduction system, factors affection working of testis, sex determination, spermatogenesis, spermatozoa, working of accessory sex glands. General physiology of milk letdown-structure of udder, milk secretion, galactopoesis, letdown of milk, formation of colostrums, milk fat and milk protein, agalactia. **Practical** Use of anticoagulants. Collection of whole blood plasma and serum. Estimation of haemoglobin. Determination of pack cell volume. Study of microscope and its uses. Study of general principals of counting cellular elements of body. Counting RBCs in blood. Counting WBCs in blood. Method of examination of blood smear for differential leucocytes count. To find out differential leucocyte count. Recording of blood pressure. Study of sperm motility. Live and dead sperm count. Study of physical and chemical properties of urine. Study of normal respiration rate in various domestic animal.	• Introduction to nervous and sensory system. • Introduction to endocrinology. • General Physiology of female genital system-puberty, oogenesis ovulation, formation of corpus luteum, estrous cycle, hormones of female reproduction system, fertilization, pregnancy and parturition. • General Physiology of male reproductive system-Erection, ejaculation, hormones of male reproduction system, spermatogenesis, spermatozoa, working of accessory sex glands. • General Physiology of milk letdown-structure of udder, letdown of milk, milk fat and milk protein, agalactia. **Practical** • Use of anticoagulants. • Collection of whole blood plasma and serum. • Estimation of haemoglobin. • Determination of pack cell volume. • Study of microscope and its uses. • Counting RBCs in blood. • Counting WBCs in blood. • Determination of differential leucocytes count. • Recording of blood pressure. • Study of sperm motility. • Live and dead sperm count. • Study of physical and chemical properties of urine. • Study of normal body temperature, pulse rate, respiration rate in various domestic animals.
Course No. LPM-111: Introductory Animal Management-1 **(Credit Hours: 2+1=3)** **Theory** Economic importance of animals and their products. Common terminologies and definitions used in animal husbandry practices of	**Course No. LPM-111: Introductory Dairy Cattle and Buffalo Management** **(Credit Hours: 2+1=3)** **Theory** • Common terminologies and definitions used in animal

cows and buffaloes. Importance of cow-buffaloes. Their classification based on utility milk purpose, draft purpose. Cows and buffalo population, income and their importance in Gujarat and in India. Exotic cattle: milk, Beaf and dual purpose breeds. Animal husbandry practices followed by professional breeders, Farmers, Farm labours and city milk producers in India, Cow and buffalo breeds of Gujarat, their synonyms, native, rearing practices, physical and economical Characters, and breeding farms. Cows: Kankrej, Gir Dangi. Buffalo: Surti, Mehsani, Jaffarabadi, banni. Brief note on /knowledge about exotic and cross breed cow, their physical and economical characters and their importance in India. Jersey, Holstein Friesian, cross breed cows. Calf rearing, care of new bone of calf, method of calf rearing with their advantages and disadvantages. Feeding rearing and breeding management of heifers. Feeding care and management of pregnant, dry and milch animals. Management of dry cow- reason for drying of cow (not milking),various method of drying. Care and management of bullock. Identification and importance of different buildings-structures of dairy farm, study of housing of milch animals and calves. Clean milk production and its importance. Maintaining records of dairy farm. Cattle yard report, service book, classified service register, daily milk production register, monthly milk production register. history sheet, Birth and death register, Roll call register, livestock register concentrate feeding register, dairy Business of Gujarat and knowledge of arrangement of milk distribution in Gujarat.

Practical

Visit to a dairy farm and study of their daily routines. Identification of dairy farm utensils, utensils of milking and milk storage, milking machine chaff cutter, weighing machine etc. Body parts of cow, bull and importance of body parts. Compost making. Cleaning and disinfection of animal house. Daily routine operations of dairy farm. Care of cow and buffalo at calving. General information like handling of animals and their control-common restraints used in cow, bullock , bull and casting of these animals. use of nose ring and bull holder

husbandry practices of cows and buffaloes.

- Economic importance of animals, their products and population in Gujarat and India.
- Utility classification of cattle and buffalo.
- Cow and buffalo breeds of Gujarat (Cows: Kankrej, Gir, Dangi & Dagri; Buffalo: Surti, Mehsani, Jaffarabadi & Banni;), their synonyms, native, rearing practices, physical characters, economical characters and breeding. Breed/Herd registration.
- Brief note on exotic and cross breed cattle, their physical, economical characters and their importance in India – Jersey, Holstein Friesian and their crosses.
- Rearing practices of cattle and buffalo.
- Care and management of calf.
- Feeding and breeding management of heifers.
- Care and management of pregnant, dry and milch animals.
- Care and management of bull and bullock.
- Shelter management of dairy cattle and buffaloes.
- Animal husbandry practices followed by professional breeders, farmers, farm labours and city milk producers in India.
- Clean milk production and its importance.
- Maintaining various records of dairy farm.

Practical

- Visit to a dairy farm and study of their daily routines.
- Study of dairy farm equipments.
- Study of external body parts of cattle and buffalo.
- Approaching and handling of cattle and buffaloes.
- Casting and restraining of cattle and buffaloes.
- Methods of identification in cattle and buffaloes.
- Determination of ageing in cow and buffalo.
- Weight determination of animal by using different methods.

etc.Identification of animal by colours and marks. Determination of age by dentition of cow and buffalo. Weight determination of animal by girth and length. Method of identification animals by firing, numbering, tattooing, ear tagging, foot ring and number at foot etc. Normal temperature, pulse and respiration of animals. Castration of male calf and dehorning of calf.	• Methods of Castration. • Dehorning of calf. • Study of existing methods of livestock farm waste management. • Cleaning and disinfection of animal house and dairy farm equipments.
Course No. ENG-111: English **(Credit Hours: 2+1=3)** **Theory** Grammatical Topics like- Parts of speech, sentence pattern, articles and determiners, tenses and auxiliaries, use of prepositions, transformation of sentences: (degree forms, voice, affirmative and negatives, use of too and enough, use though and although etc.,) direct and indirect speech. **Practical** PART-A READING: Reading with correct pronunciation and intonations from books, magazines LISTENING: Listening from recorded spoken talks, speech, records, taps, cassettes etc. DIALOGUE: Introducing one self and giving introduction of other, shorts question- answers session, short talk/ speech on given topics etc. PART-B (composition writing) Practice in comprehension passages, letter writing, story writing with the help of given clues, essay writing with the help of given clues, application writing.	**Course No. ENG-111: English** **(Credit Hours: 2+1=3)** **Theory** English Grammar: Topics • Sentence, Subject, Predicate, Phrase and the clause, Parts of speech, Noun (Kinds of Nouns, Gender, Number, Case), Adjective (Comparison of adjectives, Adjectives used as Nouns, Position of the Adjectives and correct use of Adjectives), Articles, Pronouns (Personal Reflexive, Emphatic, Demonstrative, Indefinite, Distributive, Relative and Interrogative), Verb, Active and passive voice, Tenses in detail, Infinitive, Participle, Adverb (Comparison Formation and Position of Adverbs), Preposition, Conjunction, Interjection. **Practical** PART-A • READING: Reading with correct pronunciation and intonations from books, magazines. • LISTENING: Listening from recorded spoken talks, speech, records, taps, cassettes etc. • DIALOGUE: Introducing one self and giving introduction of other, shorts question- answers session, short talk/ speech on given topics etc.

	PART-B (composition writing) • Practice in comprehension passages, letter writing, story writing with the help of given clues, essay writing with the help of given clues, application writing.
Course No. CA-111: Introduction to Computer application **(Credit Hours: 2+1=3)** **Theory** Computer- Definition, history, computer system, digital system, analog system. Block Diagram of Computer system. Functions and working of each part in block diagram. Types of Computers. Types, working and uses of various and output devices. Concept, meaning and differences of hardware and software. Operating system- DOS, WINDOWS. Directory, folder, importance of file. Data entry- text file, worksheet, entry and accounting in readymade software. Picture file, photographs (editing) and Printing, Importance and knowledge about anti-virus. Multimedia - song, music, recording, presentation etc. **Practical** Demonstration of Computer system. Demonstration and working of computer peripherals like monitor, key-board, mouse, floppy disks, CD drive, printer, etc. Uses of DOS commands. Uses of start menu, uses of paste, cut and copy of files. Preparation, editing and printing of simple text file. Preparation of work-sheet, formula and printing. Preparation of picture, photo file, editing with use of camera, scanner. Use of multimedia, net- work, e-mail, internet etc.	**Course No. CA-111: Introduction to Computer Application** **(Credit Hours: 1+2=3)** **Theory** • Computer: History, definition, types and functions. • Characteristics of computer. • Introduction of different Components of Computer system. • Definition of internet and its uses. • Basic concepts and differences of Hardware and Software. • Various types and uses of input and output devices. • Types of Storage devices. • Operating system: Introduction, types, functions and uses. • Basic concepts of Microsoft-Office: MS-Word, MS-PowerPoint and MS-Excel. • Introduction to anti-virus. • Applications of computer in animal husbandry **Practical** • Demonstration and working of computer system: monitor, keyboard, mouse, CPU, printer, CD drive, floppy disk, etc. • Basic operations in Windows operating system. • Creating, editing and printing of text files in MS-Word. • Creating, editing and preparation of presentation in MS-Power Point. • Usage of MS-Excel in farm data management. • Introduction to Internet. • Email and its usage in communication. • Application of computer in farm database management.

SECOND SEMESTER	
OLD SYLLABUS	**NEW PROPOSED SYLLABUS**
Course No. STAT- 121: Elementary Statistics **(Credit Hours: 2+1=3)** **Theory** Basic concepts: variable, statistics, types and sources of data. Classification and tabulation of data, construction of frequency distribution tables. Graphical representation of data, simple, multiple, component and percentage bar diagram; pie diagram, histogram, frequency polygon and frequency curve. Average and measures of location: arithmetic mean, mode, median, geometric mean and harmonic mean for raw and grouped data. Dispersion: range, quartiles, standard deviation, variance, coefficient of variation and standard error of mean for raw and grouped data. Sampling: basic concepts, sampling vs. complete enumeration, parameter and statistic. Sampling methods: simple random sampling and stratified random sampling. Tests of significance: basic concepts. Test for equality of means: one sample and two (independent) sample; paired t-tests. Introduction to experimental designs (CRD and RBD). **Practical** Construction of frequency distribution table. Graphical representation of data: histogram, frequency polygon, frequency curve; bar chart-simple, multiple, component and percentage bar charts; pie chart. Mean median, mode and quadrille for raw and grouped data. Tests for equality of means: one sample and two (independent) sample; paired t-tests. Analysis of CRD and RBD.	**Course No. STAT- 121: Elementary Statistics** **(Credit Hours: 1+1=2)** **Theory** • Basic concepts: Definition, importance, scope, limitations of statistics in Animal sciences. • Introduction of sample, population, parameter, data, ratio, variation, variable. • Types and source of data. Types and source of variable. • Collection of data – Introduction, types, methodology and drafting of questionnaires • Classification and tabulation: Introduction, Objectives and types. • Presentation of data (Diagrams and Graphs): Introduction and types. • Measures of central tendency: Arithmetic mean, weighted mean, geometric mean, harmonic mean, mode and median for raw and grouped data. • Measures of Dispersion: Range, standard deviation, variance, coefficient of variation and standard error of mean for raw and grouped data. • Sampling: basic concepts and types. Sampling methods: Random and non random. Sampling vs. complete enumeration. • Statistical survey: Introduction, Planning and execution. **Practical** • Tabulation of data. • Diagrammatic representation of data. • Graphical representation of data.

	• Calculation of measures of central tendency for raw and grouped data. • Calculation of measures of dispersion for raw and grouped data. • Data entry and management through MS EXCEL.
Course No. LPM-121: Introductory Animal Management-II **(Credit Hours: 2+1=3)** **Theory** Economic importance of sheep production in India and Gujarat. Different indigenous and exotic breeds of sheep. Care of lambs young stock, Weaning, Shearing. Selection of sheep for mutton and fibres. Judging of the quality and conformation of body parts. Sheep housing, routine health care, Deworming, Vaccination, Breeding schedule, care in pregnancy, lambing, lambs. Marketing of wool and mutton, their economics of production. Grading and marketing, impurities in wool. Factors influencing the quality of wool importance of goat production at national and state level. Goat production for profit livelihood. Different indigenous and exotic breed. Buck management, care of goat in pregnancy and kidding. Rearing of kids, Weaning, Fattening etc. Selection of goats for chevon and milk. Judging of the quality and conformation of body parts. Rearing sheep and goat together. Goats as leaders in grazing. Goat housing and marketing. Chevon and goat milk marketing and their economics of production. **Practical** Familiarization with livestock farm routines. Identification and selection of sheep and goat. Feeding of sheep and goat dipping, Spraying, Spotting sick animals. Examination for purities, Identification of impurities. Farm records and their maintenance. Detection of heat, mating.Care of pregnant animals, lambing, neonatal and young stock. Judging sheep for wool and mutton. Shearing and grading of wool and their bailing and storage. Layout plant for	**Course No. LPM-121: Introductory Sheep and Goat Management** **(Credit Hours: 2+1=3)** **Theory** • Common terminologies and definitions of sheep and goat. • Economic importance of sheep and goat production in India and Gujarat. • Utility classification of sheep and goat breeds. • Important sheep and goat breeds of Gujarat. • Important exotic sheep and goat breeds being used in breed improvement in India. • Rearing systems of sheep and goats in India. • Care and management of lambs and kids. • Care and management of breeding stock. • Care and management of pregnant ewe and doe. • Care and management of sheep and goat before and after parturition. • Care and management of ram and buck. • Selection and judging of sheep for mutton and fibres. • Selection and judging of goat for milk and chevon. • Sheep and goat housing. • Shearing in sheep. • Routine health care, deworming, vaccination schedule in sheep and goat. • Factors influencing the quality of wool.

sheep/goat farm of different flock size. Determination of sepals length, crimps, diameters and strength of wool fiber. Visit to a wool analytic laboratory and woolen industries. Castration of kids, detection of vices of goat, Culling. Judging of goats for chevon and sheep for mutton. Marketing of chevon and live goats.	**Practical** • Familiarization with Sheep and goat farm routines. • External body parts of sheep and goat. • Dentition and ageing in sheep and goat. • Handling of sheep and goat. • Methods of identification in sheep and goat. • Judging and selection of sheep and goat. • Dipping, Spraying and Spotting of sick animals. • Farm records and their maintenance. • Shearing and grading of wool and their bailing and storage. • Layout plant of sheep/goat farm of different flock size. • Castration of kids. • Culling in sheep and goat.
Course No. AN-121: Introductory fodder management and Grassland management (Credit Hours: 1+1=2) **Theory** Importance of fodder production in animal nutrition. Soil plant animal relationship classification of animal feed. Proximate composition of animal feeds. Agronomical practices for cultivation of leguminous roughages – Lucerne, Berseem, Cowpea, Cluster bean and sun flower. Agronomical practices for cultivation of cereal roughages (a) Maize and sorghum, Oats and pearl millet (rajkabajari). Pasture management, Silvi pasture, agro forestry and system of grazing. Agronomical practices for cultivation of grasses (a) Hybrid Napier and APPN Grass. Agronomical practices for cultivation of pasture grasses. (b) Marvel grass, Guinea grass, Para grass, Sudan grass, Dinanath, Dasarath and Anjan. Fodder trees-subabul, shevari, Borchi. Importance of unconventional feeds and fodder in livestock feeding. Preservation of forages-silage, hay making and haylage. Feeding of livestock during scarcity and management of cattle camps. Recycling of livestock waste including vermin compost, Bio gas. Preparation of cropping	**Course No. AN-121: Introductory fodder production and grassland management (Credit Hours: 1+1=2)** **Theory** • Importance of fodder production in animal nutrition. • Classification of feeds & fodder. • Agronomical practices for cultivation of leguminous crops i.e. lucerne, cowpea and cereal crops i.e. maize, sorghum, oats, pearl millet (*Rajkabajari*) and hybrid napier. • Pasture management, agro forestry and system of grazing. • Important scarcity fodders. Fodder production through intercropping and backyard cultivation. • Importance of unconventional feeds and fodder in livestock feeding. • Preservation of fodder- silage, hay and haylage making. • Recycling of livestock waste including vermin compost, Bio gas. • Agencies involved in seeds, fertilizers, animal feeds and

scheme/crop rotation for dairy fodder farm Agencies involved in seeds, fertilizers, animal feeds, pesticides. **Practical** Visit to a fodder farm. Familiarization with the various types of fodder. Agro climatic zone wise fodder crop rotation/fodder calendar. Preservation of fodders. Cost of fodder production. Familiarization with back yard fodder cropping of fodder, Silvi pasture and Agro forestry. Livestock waste utilization and recycling. Preparation of cropping scheme for dairy farm.	pesticides. **Practical** • Visit to a fodder farm. • Familiarization with the various types of fodder. • Agro climatic zone wise fodder crop rotation/fodder calendar. • Study of cost of cultivation and net realization for fodder production. • Demonstration of farm machinery involved in fodder production. • Judging of appropriate stage of fodder crops for harvesting. • Demonstration of hay making and silage making. • Preparation of cropping scheme for dairy farm. • Demonstration or visit of Livestock waste utilization and recycling unit.
Course No. AB-121: Introductory Animal Breeding **(Credit Hours: 1+1=2)** **Theory** Breeding- Definition and importance. Variation, sources of variation, implications. Choosing traits for selection. Degrees of relationship. System of breeding, inbreeding: close breeding, line breeding, Out breeding: out, cross breeding, species hybridization, grading up. Livestock breeding strategies in Gujarat. Selection methods: performance testing, pedigree selection, progeny testing, fertility and breeding efficiency, Factors affecting and technique to improve. Embryo transfer technology. Preliminary ideas of heritability, repeatability, genetic and phenotypic correlation of different economic traits. Heterosis, definition, causes, importance. **Practical** Visit to a cattle breeding farm. Study the breeding records of farms.	**Course No. AB-121: Introductory Animal Breeding** **(Credit Hours: 1+1=2)** **Theory:** • Animal Breeding: Introduction, Definition, Principles & Importance. • Variation: Importance and Sources. • Animal Genetic Resources (AnGRs) of Gujarat state: Species, Breeds, conservation and statistics. • Selection: Introduction and types. • Response to selection • Basis of selection: Individual selection, family selection, pedigree selection, progeny testing. • Methods of selection: individual selection, independent culling level, selection index. • Economic traits of livestock: Introduction and their

Analysis of breeding records of different livestock farms. Method of selection of dairy animals and breeding bulls. Identification of animal in estrus. Practical aspects of theory syllabus and basic statistical principles and practice.	improvement. • Mating Systems: Introduction and types • Livestock Breeding Policy of Gujarat state. **Practical:** • Study of dairy farm records. • Identification of livestock breeds of Gujarat state. • Standardization of breeding records. • Estimation and calculation of various economic traits of livestock. • Selection of dairy animals.
Course No. ENVS-121: Introduction to Environmental Sciences (Credit Hours: 2+1=3) **Theory** Environment: introduction, definition and importance. Components of environment interactions with organism. Animal ecology. Global and Indian environment –past and present status. Environmental pollution and pollutants. Air, water, food, soil, noise pollution sources. Causes and types. Smoke, acid rain, global warming, ozone hole, sewage and hazardous waste management. Impact of different pollutants on humans, plants, organisms and environment. Introduction to biological magnification of pollution technological and sociological measures and solutions- Indian and global efforts. India, international and voluntary agencies for environment conservation-mandates and activities. International conferences, conventions and summits- major achievements. Environmental policy and legislation in India. Introduction to environmental impact assessment. Causes of environmental degradation-socio-economic factors. Human population growth and lifestyle. Sources of water supply, contamination, and its prevention. Possibilities of recycling of farm surplus, waste etc.	**Course No. ENVS-121: Introduction to Environmental Sciences (Credit Hours: 2+1=3)** **Theory** • Scope of Environmental science. • Environment: introduction, definition and importance. • Components of environment interactions with organism. • Indian environment –past and present status. • Environmental pollution and pollutants. Air, water, food, soil, noise pollution sources. • Causes of Smoke, acid rain, global warming and ozone hole. • Impact of different pollutants on humans, plants, organisms and environment. • Introduction to biological magnification of pollution technological and sociological measures and solutions- Indian and global efforts. • Voluntary agencies of India working for environment conservation. • International conferences, conventions and summits- major achievements. • Environmental policy and legislation in India.

Practical Visit to a local areas-river /forest/grassland/catchments etc. Study of common plants, insects, birds and animals. Visit to industries to study pollution abatement techniques. Demonstration of water purification plant, sewage disposal plans, carcass and fallen animal disposal methods. Visit to a recycling plants.	• Introduction to environmental impact assessment. • Causes of environmental degradation-socio-economic factors. • Human population growth and lifestyle. • Biomedical waste management. • Disaster management- introduction, Basic concepts. **Practical** • Visit to a local areas-river /forest/grassland/catchments etc. • Study of common plants, insects, birds and animals. • Visit to industries to study pollution abatement techniques. • Demonstration of water purification plant, • Sewage disposal plans. • Carcass and fallen animal disposal methods. • Visit to a recycling plants. • Collection and examination of water sample, sampling of air, • Creating useful articles out of waste materials.
Course No. AHE-121: Introductory Animal Husbandry Extension-1 **(Credit Hours: 2+1=3)** **Theory** Extension, concept, principles, scope. Education: Formal, informal and non-formal. Formal educational Vs non-formal educations. Non-formal education Vs A.H. extension. Concept of extension. Needs for extension. Levels of extension. Philosophy of extension. Objectives of extension. Function of extension. Extension educational process. Teaching learning process. Criteria for effective extension teaching-learning. Principles of learning as applicable to extension. Principles of A.H. extension. Motivation in extension. Scope of A.H. extension. Rural sociology and psychology. Concept of rural sociology: family, social interaction, community, society, personality, leadership, value, social institution, social control, beliefs, social change. Dairying as an instruments of change in rural India. Communication process: concept:	**Course No. AHE-121: Introductory Animal Husbandry Extension-1** **(Credit Hours: 2+1=3)** **Theory** **Extension concept, principles scope** • Education: Informal, Formal, Non formal • Need for extension, the concept of extension, levels of extension, the philosophy of extension, objectives of extension, function of extension, extension education process • Teaching learning process • principles of extension education **Rural sociology** • Rural sociology: rural-urban society difference **Communication process**

communication response, empathy, homophily, heterophily, fidelity, perception, communication system. Feedback. Management information system, communication methods, its classification, audio visual aids. Adoption and diffusion of innovations: concept, adoption, diffusion, innovation, attributes of innovation, stage of adoption, innovation Decision process, over adoption. Agricultural journalism, definition, principle of Agricultural journalism. **Practical** Visit to a village institution like village panchayat, village co-operative milk marketing society, identification of key communicator and working through functional leader. Study of functioning of village institutions. Social survey, its kinds and importance. Methods and tools of data collection in social research social sampling, its kind and importance. Methods and tools of data collection in social research. Preparation of leaflets, folders and pamphlets for A.H. extension use. Use and principles of overhead projector and preparation overhead transparencies. Use and principles of LCD projector and preparation PPT presentation. Organizing a vaccination camp, farmers meet, exhibition at village level. Report writing.	• Basic functions of communication, Elements of extension communication system. **Communication methods** • Individual method, Group method and mass method **Adoption and Diffusion of innovation** • Adoption, Innovation, Diffusion, perceived attributes of innovation, adoption process, innovation decision process, over adoption, consequence of innovations, transfer of technology **Programme Planning** • Objectives , need of programme planning • Principles of Programme planning, Steps in extension programme planning, • Role of extension agent in programme planning **Practical:** • Classification of Audio visual aids • Preparation of poster for A.H. extension use • Preparation of leaflets for A.H. extension use • Preparation of folders for A.H. extension use • Preparation of pamphlets for A.H. extension use • Social survey, its kinds and importance in sampling process • Methods and tools of data collection from field to collect farmer information • Type of Sampling and sampling techniques • Use and principles of LCD projector • Visit to animal health camp/farmers meet/exhibition • Visit to village institution • Visit to dairy cooperative society

THIRD SEMESTER

OLD SYLLABUS	NEW PROPOSED SYLLABUS
Course No. AHE-212: Introductory Animal husbandry Extension-II **(Credit Hours: 2+1=3)** **Theory** Statistics of livestock & products of the state and nation. Organizational aspects of livestock farm, resource management, record keeping and accounting. Aspects of livestock farm, tools of management, function of management Entrepreneurship as an instrument of socio-economic transformation: Scope for a successful entrepreneur in livestock sector like, livestock feed manufacturing, dairy farming, livestock-poultry, dairy products manufacturing and marketing, farm equipment manufacturing and marketing etc. Knowledge of working and powers of officials of the department. Knowledge of various schemes and programmes of the department. Milk recording, herd registration, bull registration, owner registration, artificial insemination, follow up should be visualized. Animal production programme (Individual benefit scheme)-Cross breeding programme. Special poultry, swine, sheep, goat production. Information of departmental activities of animal husbandry, poultry and swine, sheep, goat production. Information of departmental activities of animal husbandry, poultry and swine husbandry. WTO and its implication on Indian dairy farming, Market, marketing, types of marketing. Functions of marketing. Channels of marketing of livestock products. Comparison of dairy farming on India with that of advanced countries of world. Integrated farming, need for integrated farming: factors determining types of integrated farming or factors to be considered for integrated types of farming, Physical condition: Topographic factors, climatic condition, pattern of rainfall, nature of water balance. Socio-economic conditions: Population pressure,	**Course No. AHE-211: Introductory Animal husbandry Extension-II** **(Credit Hours: 2+0=2)** **Theory** **Livestock Entrepreneurship:** • Entrepreneur, concept of entrepreneurship, Characteristics of entrepreneur, Difference between entrepreneur and Manager, Types of entrepreneur • Types of business organization, Business organizing process, • Major schemes of state and central govt. in livestock entrepreneurship development • Various state government institutions involved in entrepreneurship development **Co-operative Society:** • Objectives of Co-operative society, Principles of Cooperation • Impact of co-operative society in animal husbandry sector • Operation flood, NDDB **Panchayti raj** **Types of farming:** small scale farming, Large scale farming, Mixed farming, Co-operative farming, Integrated farming

pattern of land ownership, land inequalities, occupational structure. Technological advancement: Traditional pattern, modern pattern, level of mechanization, various systems of integrated farming: cash crop & vegetable crop integrated with dairy cattle. Cash crop & horticultural crop integrated with dairy cattle. Horticulture + rabbit farming +duck farming + wormi compost, goat farming, fish farming, bee keeping, cross bred dairy cow, buffalo and various other combination of integration and their economic viability & sustainability. Other income generating programmes. **Practical** Visit to a private, co-operative or public dairy enterprise. Study of economic aspects of a private, co-operative or public dairy or any livestock enterprise. Book keeping, to know about the book keeping and general entry. Visit to an integrated farming, units/village and collection of data (three different combinations for three different practical) and to study the economic aspects of the same. To study about the trading account, profit and loss account and balance sheet. To visit cattle fair, livestock market, backyard unit and study their tools of management. Farm budgeting, its importance, object, methods and advantages. To estimate a project of 12 cross-breed cows. To estimate a project of 12 buffaloes. To estimate a project of 12 dairy cows. To estimate a project of 1000 layer birds.	
Course No.VMI-211: Introductory Veterinary Microbiology (Credit Hours: 2+1=3) **Theory** Microbiology of unicellular organisms and their classification. Microbiology and structure of bacteria, shape, size and arrangement of bacteria, microbiological variations and classification of bacteria. Important bacterial, viral and fungal disease of animal. Source of infections. Methods of transmission of infections. Sterilization,	**Course No.VMI-211: Introductory Veterinary Microbiology (Credit Hours: 2+1=3)** **Theory** • Introduction to microbiology (History & Branches). • Microbiology and structure of bacteria, shape, size and arrangement of bacteria. • Microbiological variations and classification of bacteria. Source of infections.

disinfection, evaluation of disinfectants and antiseptics. Aseptic handling of sterilization materials; disinfection of animals. Introduction, morphology, growth, nutrition, reproductive and classification of fungi. Classification, cultivation and replication of viruses. **Practical** Microscopy and routines, Staining (Simple & Grams), Acid fast, Lactophenol cotton blue, Special staining: leishmenn, methylene blue staining. Glassware preparation. Sterilization, evaluation of disinfectants, asepsis etc. Preparation of reagents media, Demonstration: Equipment and sterilization disinfection, Cultural characters, Pathogenicity test and antibiogram, slide culture technique for fungus	• Methods of transmission of infections. • Sterilization, disinfection, and aseptic handling of sterilization materials. • Introduction, morphology, growth, nutrition, reproduction and classification of fungi. • Introduction to general characteristics of virus, basic classification, cultivation and replication of viruses. • Microbiological feature of important bacterial, viral and fungal disease, its diagnosis in animal and vaccine. **Practical** • Microscope: Its parts, uses and maintenance. • Demonstration of various laboratory equipments and apparatus. • Glassware preparation. Sterilization. • Preparation of reagents media. • Simple Staining i.e. methylene blue and Negative stain, Differential staining i.e. • Grams and Acid fast stain. Lactophenol cotton blue for fungi. Blood smear stain i.e. Leishaman, Field and Giemsa stain. • Cultivation of bacteria and fungi. • Antibiotic sensitivity test. • Demonstration of important serological tests for disease diagnosis.
Course No.VPARA-211: Introductory Veterinary Parasitology **(Credit hours: 2+1=3)** **Theory** Introduction of Parasitology, history, definitions. Importance of	**Course No.VPARA-211: Introductory Veterinary Parasitology** **(Credit hours: 2+1=3)** **Theory**

Parasitology in animal science curriculum. Parasites and parasitism. Type of parasitism. Classification of parasites. Important cestodes of livestock, their life cycle, mode of transmission and control measures. Important trematodes of livestock, their life cycle, mode of transmission and control measures. Important nematodes of livestock, their life cycle, mode of transmission and control measures. Important of protozoa of livestock, their life cycle, mode of transmission and control measures. Important insects, ticks and mites of livestock, their life cycle, mode of transmission and control measures. **Practical** Examination of the faecal samples for the trematode, cestode and nematode eggs. Demonstration of the life cycle and development of the type species of trematode, nematode, cestode, acanthocephalan. Demonstration of the type representative of various groups of insects, ticks and mites through charts, specimen, mounted slides etc. Demonstration of differential characters of insect and acarina (ticks and mites). Procedure for diagnosis of arthropoda infestation to hides and skin. Examination of the faecal materials for identification of intestinal protozoa, Coccidia, flagellates etc. Preparation of blood smears, their staining and examination of slides for haemoprotozan parasites. Methods of collection, fixation, preservation and mounting of protozoan parasites.	• Introduction of Veterinary Parasitology. • Parasite and its types. • Host and its types. • Classification of parasites. • Important morphological features, life cycles, clinical signs and symptoms, diagnosis, prevention and control of liver flukes, blood flukes, rumen fluke, lung fluke. • Important morphological features, life cycles, clinical signs and symptoms, diagnosis, prevention and control of ruminant tape worms, dog tape worms, poultry tape worms, broad fish tapeworm and *Spirometra*. • Important morphological features, life cycles, clinical signs and symptoms, diagnosis prevention and control of *Ascaris, Parascaris, Toxocara, Toxascaris, Ascaridia, Heterakis* and *Oxyuris. Strongyloides, Strongylus, Syngamus* and *Oesophagostomum*. Kidney worms hook worms, *Trichostrongylus*, and *Haemonchus. Habronema, Draschia, Thelazia, Spirocerca,* and *Gongylonema. Dirofilaria, Parafilaria, Onchocerca, Setaria* and *Stephanofilaria*. Lung worms *Trichuris* and *Capillaria*. Acanthocephala. • Important morphological features, life cycles, vector potentiality and control of biting midges, black flies, mosquitoes, horse fly, house fly, stable fly, flesh fly, warble fly, stomach bot fly, nasal bot fly, bottle flies, sheep ked, lice, fleas, soft ticks, hard ticks, mites. • Important morphological features, life cycles, clinical signs and symptoms, diagnosis prevention and control of *Trypanosoma, Trichomonas, Histomonas, Giardia* and *Balantidium*, coccidia of poultry and domestic animals. *Babesia, Theileria, Anaplasma, Coccidia* and *Ehrlichia*. **Practical** • Methods of collection, fixation, preservation and mounting

	of parasites. • Faecal examination for the gastrointestinal parasites. • Blood examination for the haemoparasites. • Skin scraping test for the ectoparasites. • Demonstration of the type species of trematode, nematode and cestodes through charts, specimen, mounted slides etc. • Demonstration of the type species of insects, ticks and mites through charts, specimen, mounted slides etc. • Demonstration of the type species of haemoparasites through slides, charts, etc.
Course No. VPA-211: Preliminary Pathology **(Credit hours: 2+1=3)** **Theory** Introduction to scope of pathology. Common terminologies of pathology: Pathology, health, disease, etiology, predisposing, pathogenesis symptoms or sign, lesion, diagnosis, incubation period, prognosis morbidity, mortality, autopsy, Biopsy, Necrosis, Somatic death, inflammation, fever/pyrexia, study of different causes of diseases. Mode of transmission of disease. Disturbance of growth: common terminology aplasia, agenesis, hypoplasia, atrophy hypertrophy, metaplasia, dysplasia. Local defence mechanism. Resistance to infection. Preliminary pathology of common diseases. Collection of various samples for laboratory diagnosis care in preservation and dispatch of sample. Preparation for post mortem. Post mortem examination. Procedure to be followed in collection of samples of specimen for laboratory examination. **Practical** Demonstration of post-mortem of livestock and poultry. Post mortem technique and collection of morbid materials. Technique of preservation, dispatch and section cutting. Record keeping of all kinds for pathology laboratory.	**Course No. VPA-211: Preliminary Pathology** **(Credit hours: 2+1=3)** **Theory** • Introduction to scope of pathology. • Common terminologies of pathology: Pathology, health, disease, etiology, predisposing, pathogenesis symptoms or sign, lesion, diagnosis, incubation period, prognosis morbidity, mortality, autopsy, Biopsy, Necrosis, Somatic death, inflammation, fever/pyrexia. • Study of different causes of diseases. • Mode of transmission of disease. • Disturbance of growth: common terminology aplasia, agenesis, hypoplasia, atrophy hypertrophy, metaplasia, dysplasia. • Wound healing by primary and secondary intention including growth factors. • Local defence mechanism and resistance to infection. • Preliminary pathology of common diseases. • Collection of various samples for laboratory diagnosis, care in preservation and dispatch of sample. • Procedure to be followed in collection of samples of

	specimen for laboratory examination. **Practical** • Demonstration of post-mortem of livestock and poultry. • Post mortem technique, preparation for post mortem. Post mortem examination. • Record keeping of all kinds for pathology laboratory. • Collection of various samples for laboratory diagnosis care in preservation and dispatch of sample. • Urinalysis- physical, chemical and microscopic techniques for urine analysis. • Clinical estimation of haematological parameters (Haemoglobin, PCV, TEC, TLC, DLC) from clinical samples. • Collection of biopsy and cytology including exfoliative cytology as rapid diagnostic techniques.
Course No. AN-211: Introductory Animal Nutrition-I **(Credit Hours: 1+1=2)** **Theory** History of animal nutrition. Importance of nutrients in animal health and production Composition of animal body and plants. Biochemical bases of soil, plant and animals Nutritional terms and definitions. Nutrients and their metabolism. Role and requirements of water. Carbohydrates, their digestion, absorption and metabolism in ruminants. Proteins and amino acids, their digestion, absorption and metabolism in ruminants. Use of NPA compound for ruminants. Lipids and their utility. Mineral elements and their functions importance of macro and micro elements in livestock health and production. Importance of vitamins, their deficiency symptoms, requirements in feed. Feed additives in the ration of livestock. Antibiotics and hormonal compounds and other growth stimulants, probiotics: their use and abuses. **Practical**	**Course No. AN-211: Introductory Animal Nutrition-I** **(Credit Hours: 1+1=2)** **Theory** • History of animal nutrition. • Nutritional terms and their definitions. • Common feeds and fodder, their classification with example and availability. • Unconventional feeds and fodder and their significance in livestock feeding. • Proximate composition of feeds. • Importance of nutrients in animal body, their functions. Classification with examples, and requirements in ration (Water, Carbohydrates, Protein, Fat, Vitamins, and Minerals). • Feed additives, its uses and example. *Antibiotics, prebiotics* and probiotics in the ration of livestock and poultry.

General precautions while working in Animal Nutrition Laboratory. Preparation of normal solutions. Preparation of standard solutions. History of proximate principles of feed preparation of common reagents and indicators. Preparation of samples for chemical analysis. General precautions while weighing feed fodder sample. Estimation of dry matter, ash, acid insoluble ash in feed sample. Familiarization of various feed and fodders.	**Practical** • General precautions while working in animal nutrition laboratory. • Overview of animal nutrition laboratory. • Familiarization of common feeds and fodders, their classification, selection and identification. • Preparation of commonly used solutions, reagents and indicators. • Preparation and processing of samples for chemical analysis – herbage, faeces, urine and silages. • General precautions while weighing feeds and fodders. • Weende's system of analysis. • Estimation of dry matter in feed sample. • Estimation of total ash in feed sample.

FOURTH SEMESTER	
OLD SYLLABUS	**NEW PROPOSED SYLLABUS**
Course No. AHEM-221: Introductory Animal Husbandry Economics and Marketing (Credit Hours: 2+0=2) **Theory** Nature and scope of economics, definition and concepts, divisions of economics, economic systems, approaches to the study of economics. Consumption-theory of consumer behaviour, laws of consumption, classification of goods. Wants-their characteristics and classification, utility and its measurement. Theory of demand, demand schedule and curve market demand. Price, income and cross elasticities. Engle's law of family expenditure-consumer's surplus. Theory of firm, factors of production- land and its characteristics- classification and capital formation. Enterprises-forms of business organization-merits and demerits. Lows of return – cost concepts. Law of supply – schedule and curve elasticity's. Money & bank. Marketing:-Concepts of marketing, Needs of marketing. Marketing of perishable and non-perishable items. Types of marketing, functions of marketing, Defects of marketing, measure of improvement.	**Course No. AHEM-221: Introductory Animal Husbandry Economics and Marketing (Credit Hours: 2+1=3)** **Theory** **Economics** • Nature and scope of economics, definition and concepts, divisions of economics, economic systems, approaches to the study of economics. • Consumption-theory of consumer behaviour, laws of consumption, classification of goods. • Wants-their characteristics and classification, utility and its measurement. • Theory of demand, demand schedule and curve market demand. Price, income and cross elasticity. • Engle's law of family expenditure-consumer's surplus. • Theory of firm, factors of production- land and its characteristics, classification and capital formation, Laws of return – cost concepts. • Law of supply – Supply schedule, Supply curve & elasticity **Marketing** • Concepts of marketing, Needs of marketing. • Marketing elements (Importance of logos, slogans, taglines in marketing). • Marketing of perishable and non-perishable items. • Types of market, functions of marketing, Problems of livestock marketing, measures for improvement. **Practical:** • Basic terms related to banking and investment. • Visit to business organization • Importance of record keeping in business organization.

	• Preparation of project report for livestock entrepreneurship. • To prepare project for 10 cross breed cows/indigenous cows/ buffaloes. • To prepare project for 100 goats • To prepare project for 1000 broiler birds • To prepare project for 1000 layer birds • Use of information technology in livestock entrepreneurship/various websites etc • Visit to livestock entrepreneur/ progressive farmer
Course No. AN-222: Introductory Animal Nutrition-II **(Credit Hours: 1+1=2)** **Theory** Enzymes/ Metabolites. Vitamins. Hormones. Toxic plants and poisonous food stuffs. Economic status of animal feed. Feeding of diseased animal. Utility of trees as roughage. Study of non-conventional feed. Feeding management of different animals like young ones, pregnant animals, dry/ lactating animals, breedable male, sick animals. Grazing farm management. **Practical** Preparation of concentrate, identification of roughage, crops, trees and cereals as animal feed. Calculation of nutritive values in terms of DCP, TDN, & MF for maintenance, growth & production. Formulation of ration for different livestock under different condition. Familiarization of various feed stuff, fodder and their selection. Proper methods of preparation of roughage, various methods of its preparation, visit to feed factory, dairy & poultry farms.	**Course No. AN-221: Introductory Animal Nutrition-II** **(Credit Hours: 1+1=2)** **Theory** • Importance of scientific feeding, Balanced ration and its characteristics. • Overviews of feeding standards for ruminants. • Feeding management of dairy cattle and buffalo during different phase of growth, development and production • Feeds for different class of poultry. • Feeding of sick animals. • BIS specifications for cattle feeds, poultry feeds and mineral mixture. • Use of NPN compounds for ruminants, its significance and precautions. • Various physical, chemical and biological methods of feed processing for improving the nutritive value of inferior quality roughages. • Common anti-nutritional factors of feeds and fodders i.e. cyanide, nitrate and saponin. • Feeding of livestock during natural calamities. • Concept of total mixed ration (TMR), Bypass protein, Bypass fat and chelated minerals.

	Practical • Calculation of nutritive value of feeds in terms of DCP and TDN. • Methods of formulation of concentrate mixture. • Formulation of ration for different livestock by thumb rule method. • Demonstration of the methods for improving the nutritive quality of straws and other crop residues. • Visit to feed factory, dairy farm and poultry farm.
Course No. VP-221: Introductory Pharmacology **(Credit Hours: 3+2=5)** **Theory** Introduction to Pharmacology: Historical development, branches and scope of Pharmacology, Sources of drugs, Pharmacological terms and definitions. Principles of Drug Activity: Pharmacokinetics- absorption, biotransformation and excretion of drug; Local anaesthetics (analgesic); Neuromuscular blocking agents: Peripheral and central muscle relaxants. Drugs acting on digestive tract: stomachics, antacids, intestinal astringents, carminatives, antizymotics, emetics, anti-emetics, purgatives, choleraetics and cholagogues. Drugs acting on respiratory system: expectorants and anti-tissues, respiratory stimulants; bronchial dialators. Drugs acting on urinogenital system: diuretics, urinary alkalizers, acidifiers and antiseptics, fluid therapy ecbolics. Vitamins: only in relation to pharmacotherapeutic effects. Drugs acting on skin and mucous membrane. ANTIBACTERAL AGENTS: Classification, general principles in antibacterial chemotherapy, sulphonamides and their combination with trimethoprim; sulfones; nitrofurans. ANTIBIOTICS: Penicillins and cephalosporins, aminoglycosides, tetracyclines, chloramphenicol. Polyteptides etc.: antituerculosis agents; miscellaneous agents; methelamine, nalidixic acid etc. ANTIFUNGAL AGENTS: Topical and systemic agents including antifungal antibiotics. ANTHELMINTHICS: Drugs and against	**Course No. VP-221: Introductory Pharmacology** **(Credit Hours: 2+2=4)** **Theory** • Introduction to Pharmacology: Historical development, branches and scope of Pharmacology. • Definitions of the terms: Pharmacology, Pharmacy, Chemotherapy, Therapeutics, Toxicology, Posology and metrology etc. • Nature and sources of drugs; Routes of drug administration; Dosage forms; Pharmaceutical processes; Handling of Hazardous substances. • Antiseptics and disinfectants; Weights and measures. • Definition of pharmacological terms related to various systems: digestive system, respiratory system, urinary system, skin and mucous membrane and pain management. analgesics and antipyretics used as oral administration. • Classification & General principal of chemotherapeutic drugs in animal use. • Definition Broad therapeutic classification of drugs employed in minor Veterinary Practice- Definitions, examples and therapeutic uses in animals. • Scope of toxicology, Sources of poisoning, mode of action, its diagnosis and treatment/management of poisons.

cestodes, trematodes, nematodes, drug tolerance, broad spectrum anthelminthics. ANTIPROTOZOAL AGENTS: Drugs used in trypanosomiasis, theilariasis, babesiasis, anaplamosis, malaia, coccidiossis, amoebiasis, giardiasis, trichomoniasis etc. ANTISEPTIC AND DISINFECTANTS: INDIGENOUS DRUGS: Source of alkaloids, glycosides, resins gums, tannins, fixed, and volatile oils; plant drugs with proven pharmacological and therapeutic efficacies in various animal and human ailments: popular indigenous drugs(antiseptics, antifungals, anthelminthics, arthropode repellants). GENERAL TOXICOLOGY; Definition scope of toxicology, Sources of poisoning, mode of action of poisons, Factors modifying the toxicity and Line of treatment of the poisoned cases. **Practical** Pharmacology : Fittings and apparatus, labeling, custody of poisons, weighing of drugs, pharmacy calculations, definition of pharmacological terms related to various systems, drug standards and regulations prescription writing; Pharmacy preparation: triple carb, antidiarrhoeal powder, dusting powder, iodine ointment with and without methyl salicylate: red iodide of mercury ointment, mistura alba, carminative mixture, ammonia liniment, turpentine liniment etc. Pharmacy Preparations: Potassium permanganate solution, lugol's iodine solution, trepan blue solution, gentian violet solution, tincture iodine benzoin co., boric acid ointment, zinc oxide ointment, ointment of salicylic acid with benzoic acid etc. Demonstration of toxic weeds and plants.	• Alternative approaches (Indigenous drugs etc...) used as therapeutic in minor Veterinary practices. **Practical** • Pharmacology: Introduction of apparatus and fittings, labeling. • Custody of poisons/ Handling of Hazardous substances. • Weighing of drugs, pharmacy calculations. • Drug standards and regulations. • Prescription writing. • Pharmacy preparation: triple carb, antidiarrhoeal powder, Simple ointment, iodine ointment, carminative mixture, turpentine liniment. Pharmacy Preparations: Potassium permanganate solution, lugol's iodine solution, tincture iodine, ointment of whitfield /salicylic acid with benzoic acid etc. Demonstration of toxic weeds and plants. • Demonstration of Herbal plants.
Course No. AR-221: Introductory Animal Reproduction-I **(Credit Hours: 1+2=3)** **Theory** Physiology of reproduction- Puberty, estrus cycle, sighs of heat, reproductive hormones, conception, gestation and parturition and their importance. Knowledge of instrument used during artificial insemination and their sanitization, Cryogenic jar and their	**Course No. AR-221: Artificial Insemination in Farm animals.** **(Credit Hours: 1+2=3)** **Theory** • Introduction to terminologies pertaining to the animal reproduction. • Introduction to male and female reproductive organs.

maintenance, Artificial insemination- Collection, preservation and transportation of semen. Insemination by speculum/ per rectal route, use of frozen semen, details of insemination technique, preservation and usefulness of frozen semen. Precautions of handling of liquid nitrogen semen. **Practical** To get knowledge of reproductive organs. Live animal/reproductive organs. Obtained from slaughter house/ phantom box etc. per rectal examination reproductive organs. Artificial insemination- Thawing, preparation of A.I.gun, practice of artificial insemination. Study of semen quality. Study of morphology and motility of sperms. Maintenance of frozen semen, cryogenic jar and apparatus used in artificial insemination. Study of female genitalia; palpation technique. Heat detection in farm animal and companion animals.	• Puberty and estrus cycle and its patterns in farm animals. • Artificial insemination: history, advantages and disadvantages. • Semen collection using AV method and freezing. • Basic steps of semen evaluation. • Transportation of semen. • Recto-vaginal method of Artificial insemination. • Handling of frozen semen straws. • Post-Insemination advice and follow-up. • Precautions of handling of liquid nitrogen. • LN_2 container: Structure, handling and its maintenance. **Practical:** • Demonstration of female genitalia. • Methods of heat detection in farm animals. • Palpation of female genitalia by per rectal examination in live animal or via phantom box. • Demonstration of instruments used for artificial insemination. • Sanitization of equipment used in artificial insemination and semen laboratory. • Preparation of artificial insemination gun. • Demonstration of recto-vaginal method of artificial insemination in farm animals. • Demonstration of preparation of artificial vagina for semen collection from cattle and buffalo. • Visit to a frozen semen station/laboratory.
Course No. AHC-221: Introductory Animal Health Care-I **(Credit Hours: 2+2=4)** **Theory** Sign of healthy and diseased animal-history, etiology, diagnosis, symptoms, treatment, and death. General disease of different system of	**Course No. AHC-221: Introductory Animal Health Care-I** **(Credit Hours: 3+1=4)** **Theory** (A) Etiology, clinical signs, diagnosis and first aid of following diseases:

animals-disease of digestive system-stomatitis, pharyngitis, choke, simple indigestion, bloat, impaction of rumen, colic, constipation, enteritis, dysentery, traumatic recticulitis, traumatic pericarditis, intestinal obstruction, hepatitis, jaundice, liver cirrohosis etc. Disease of respiratory system- URL, epistaxis, pneumonia, drenching pneumonia, pleuricy bovine asthma etc. disease of urinary system-nephritis, urinary calculi, retention of urine, hematuria etc. Disease of reproductive system-mastitis, metritis, pyometra, dystocia, retention of placenta etc. Disease of nervous system-meningitis, encephalitis etc. Metabolic diseases- milk fever, downer cow syndrome, ketosis, hemoglobinurea, hypomagnaesmic tetany, vitaminosis-A, pica etc. Disease of skin, eye, ear and joints- dermatitis, eczema, scabies, conjunctivitis, otitis, rheumatism etc. Knowledge of instrument, use in laboratory or hospitals, methods of their sterilization. Definition of sepsis and asepsis. Suturing and treatment of wound, abscess. Sign and handling of simple fractures, sprain and dislocation, choke, prolapse of vagina, uterus and rectum. Assistance in anaesthesia and operation of animals. Suturing of skin and the instrument used thereof. Firing, tattooing, dehorning, and docking. **Practical** Clinical Attendance, Administration of drugs, care and management of sick indoor and outdoor animal. Diagnose the disease by recording symptoms, temperature, pulse, respiration. Awareness and uses of surgical instrument. Sanitization/Sterilization of instrument used in hospital, first aid and bandaging of wounds etc. To prepare site for operation and to help veterinary doctor during operation. Demonstration of castration and other minor surgical procedures.	- Diseases of Digestive System (Stomatitis, Choke, Simple Indigestion, Bloat, Ruminal Acidosis, Enteritis, Colic) - Diseases of Respiratory System (Epistaxis, Pneumonia) - Diseases of Urinary System (Nephritis, Urolithiasis, Hematuria, Cystitis) - Udder/Mammary gland affections (Mastitis, Agalactia, Hemagalactia) - Metabolic & Deficiency Diseases (Milk fever, Ketosis, Hypomagnaesemic tetany, Vitamin deficiencies, Mineral deficiencies) - Diseases of the Skin, Eye & Ear (Otitis, Dermatitis, Scabies, Eczema, Conjunctivitis) - Miscellaneous conditions [Poisoning in animals (HCN, Nitrate, OPs, Urea), Snake bite, Heat stroke] **(B) Etiology, clinical signs, diagnosis, first aid, prevention and control of following infectious diseases:** 1. Bacterial diseases: Anthrax, HS, Brucellosis, TB, JD, Actionmycosis, Actinobacillosis, Leptospirosis, Salmonellosis, CCPP, Tetanus, Enterotoxaemia, Colibacillosis 2. Viral diseases: FMD, Pox (Cow pox, Sheep pox, Fowl pox), Rabies, BVD-MD, Ephemeral fever, Ranikhet disease, Marek's disease, Contagious ecthyma 3. Fungal disease: Ring worm, Aflotoxicosis 4. Parasitic diseases: - Protozoal diseases (Anaplasmosis, Theilariasis, Babesiosis, Surra) - Helminths (Fasciolasis, Amphistomiasis, Ascariasis, Tapeworm) - Ectoparasites (Ticks, Fleas, Lice, Mites)

	(C) Elementary knowledge about deworming and vaccination of domestic animals and poultry. **Practical** • Knowledge of instrument used in laboratory or hospitals including cleaning, sterilization and maintenance • Case registration, maintenance of medicine register and record keeping • Clinical attendance and history taking • Basic understanding of routes of administration of drugs • Care and management of sick indoor and outdoor animals • General examination of animals (Recording of body temperature, heart rate, pulse rate, respiration rate, ruminal motility) • Demonstration of different diagnostic procedures (Use of stethoscope/auscultation, palpation, thermometer, metal detector) • Collection, handling, preservation, transport and processing of samples (milk, urine, feces, skin scrapings and blood) for disease diagnosis

FIFTH SEMESTER

OLD SYLLABUS

Course No. AR-312: Introductory Animal Reproduction-II
(Credit Hours: 1+2=3)

Theory

Reproductive disease, anoestrus, sterility/ infertility, silent heat, repeat breeding and retention of placenta, pyometra, functional infertility, cystic ovary. Obstetrical problems and their management. Pregnancy diagnosis. Maintenance of artificial insemination and breeding records. Sexual health control and herd reproductive health programme. Parturition stages, care during and after parturition.

Practical

Approach to post-operative care of animals operated too obstetrical cases/second. Endocrine control of reproduction in male domestic animal. Forms of male infertility. Factors affecting infertility in male. It diagnosis & primary treatment. Pregnancy diagnosis and differential diagnosis/second. Study of identification uses various instruments & appliance/second. Artificial insemination – practice. Pregnancy diagnosis. Practical knowledge in case of retention of placenta, prolapse.

NEW PROPOSED SYLLABUS

Course No. AR-311: Reproduction in Farm Animals.
(Credit Hours: 2+1=2)

Theory

- Gestation period in farm animals.
- Pregnancy diagnosis in farm animals.
- Parturition stages and care during and after parturition.
- Nursing care of new born calf.
- Introduction to reproductive disease conditions in farm animals i.e. Definition. etiology, common clinical signs and preventive measures:
  - ✓ Silent heat
  - ✓ Anoestrus
  - ✓ Repeat breeding
  - ✓ Endometritis
  - ✓ Pyometra
  - ✓ Metritis
  - ✓ Uterine and vaginal prolapse

Practical:

- Familiarization with the equipment used in obstetrical operations.
- Care of animal operated for obstetrical operation.
- Demonstration of pregnancy diagnosis in farm animals.
- Postpartum management in farm animals.
- Considerations for fertility improvement in farm animals.
- Measures of reproductive performance in dairy herds.

Course No. VPH-311: Introductory Veterinary Public Health (Credit Hours: 2+2=4)	Course No. VPH-311: Introductory Veterinary Public Health (Credit Hours: 2+1=3)
Theory **Theory** Introduction: definition of veterinary public Health. Milk hygiene in relation to public health. Microbial flora of milk and milk products. Source of bacterial contamination of raw milk and method of control. Clean milk production: source of contamination during collection and transport and processing of milk and methods of control. Hygiene control of dairy equipment and dairy products. Quality control of milk products. Milk hygiene practice in India and other countries. Milk borne diseases and methods of control. Definitions and objectives of zoonosis. Classification of zoonosis, Role of domesticated pets, various wild and cold blooded animals in transmission of zoonotic diseases. Mode of transmission of zoonotic diseases and Study of the important zoonotic diseases of the region. Methods of prevention, control and eradication of zoonotic disease. Socioeconomic condition and Human Health zoonosis. **Practical** Collection of milk samples for chemical and bacteriological examination. Grading of milk, on the basis of MBR test: preparation of sample for detection of antibiotic residues in milk and milk products. Preparation of sample for bacteriological examination of raw and pasteurized milk, product and water for processing plant viz. its S.P.C. coliform count, faecal streptococcal count, detection of adulteration and detection of preservatives in milk ; adulteration in ghee. Test of mastitic milk in relation to public health. Visit to primary health centres to study the common condition of rural population. Demonstration of water purification plant, sewage disposal system and carcass/fallen animal disposal methods.	**Theory** • Introduction related to veterinary public health. • Different definition related to veterinary public health. • Dairy milk hygiene practices on dairy farm and public health. • Most common microbial flora of milk and milk products. • Source of bacterial milk contamination and method of control. • Hygienic milk production: Collection, Processing, Pasteurization and Transport and equipment hygiene. • Milk hygiene practice in Gujarat in comparison to other part of India. • Most common milk borne diseases. • Meat hygiene related terminology. • Meat hygiene practices. Humane transport of food animals and birds. • Meat adulteration and its test. Meat borne diseases. • Definitions of zoonosis. Classification of zoonosis, Role and transmission of local domesticated, wild and cold blooded animals in transmission of zoonotic diseases. • Study of the important regional specific common zoonotic diseases and its methods of prevention and control. • Most commonly used terminology related to epidemiology. **Practical** • Collection of milk samples for quality examination. • Grading of milk on the basis of MBR test. • Test for efficiency of milk pasteurization. • Demonstration of S.P.C. • Demonstration of coliform count.

	• Detection of adulteration in milk. • Carcass/fallen animal disposal methods. • Hygienic disposal of farm waste.
Course No. VSUR-311: Minor Veterinary Surgery **(Credit Hours: 2+1=3)** **Theory** Introductions, history, classification and development of Veterinary Surgery. General Surgical principles, preoperative and post-operations. Importance of sutures, suturing materials and different knots asepsis-antisepsis, their application in Veterinary Surgery. Knowledge of instrument, used in laboratory or hospitals and materials used in surgery. Methods of their sterilization. Inflammation, abscess, tumours, cysts, haemorrhage, haematoma, necrosis, gangrene, burn and scald, surgical affections of muscles, etc. and their treatment, Wound: classification, symptoms-diagnosis and treatment; complications and their preventions. Surgical infections and their preventions and their management. Sign and handling of simple fracture, sprain and dislocation and other affections of joints. Different kinds of bandages, its application. Sign and handling of choke, prolapsed of vagina, uterus and rectum. Assistance in anaesthesia and operation of animals. Suturing of skin and the instrument used thereof. Firing, tattooing dehorning, castration with burdizzo castrator. **Practical** Introduction to the layout of operation theatre, common equipments, surgical instrument. Restraint, positioning, bandaging, catheterizations etc. Operations theatre routines. Preparation of surgical pack, sterilization. Familiarization with various suture materials, sutures. Tying surgical knots, double hand, single hand etc. tension sutures; bowel and uterine sutures. Demonstration of surgical operation-control of hemorrhage, suturing etc. Demonstration of live surgery or recorded operations. Firing, tattooing, dehorning, docking, castration with	**Course No. VSUR-311: Minor Veterinary Surgery** **(Credit Hours: 2+1=3)** **Theory** • Introductions, history, classification and development of Veterinary Surgery. • Objectives of surgery • General surgical principles Preoperative and post-operative considerations. • Importance of sutures and suturing materials. • Asepsis, antisepsis and their applications. • Basic Surgical instruments and its uses. • Methods of their sterilization. • Introduction to Inflammation, abscess, cysts, hemorrhage, burns and scald. • Introduction to Wound and its primary management • Introduction to Fracture, its basic classification and Primary Management • Different kinds of bandages and its application. • General considerations of anesthesia and preparation of patients. **Practical** • Introduction to the layout of operation theatre • Preparation of operation theatre and its maintenance • Identify the common surgical instruments and their use • Restraining and positioning of surgical patients • Preparation of general surgical pack • Preparation of surgical team • Preparation of surgical patients

burdizzo castrator.	• Methods of sterilization • Familiarization with various suture materials • Control of hemorrhage • Primary management of wound • Application of bandages • Preoperative and post-operative monitoring of surgical patients.
Course No. LPM-313: Introductory Animal Management-III (Credit Hours: 2+1=3) **Theory** Economic importance of poultry, development of poultry industry in India, different breeds and varieties of chicken, ducks and turkeys; terms used in poultry science; how egg is formed– structure of eggs. Formation yolk, albumen and shell; selling of poultry and effect of culling on egg production, incubation of hatching of eggs, selection of hatching eggs, handling and care of hatching eggs, natural and artificial breeding, brooders. Season for breeding; different systems of housing of poultry; floor space requirements construction details of poultry houses and hatcheries,cost of construction, construction of budget poultry sheds for small, medium and large operators; layout plants for poultry farm of various sizes, poultry equipments: incubators, brooders, debeakers, trapnets, feeders and waterers etc. Care and management of chicks, pullets and cockerels, care and management of broilers and layers, feeds and feeding of broilers and layers, poultry farm records; commercial hatcheries and its role in poultry development; random, sample tests; preparation of poultry for show; poultry judging: disinfection of incubators, brooders, farm implement and poultry houses. Disposal of poultry wastes. Utility of poultry manure. Economy in poultry production- Cost of production of table and hatching eggs. broiler meat. Day-old-chick-Preparation of project reports for broiler, layers, and hatchery. Cockrel and Japanese Quail farms. Role of avian farms in a mixed farm unit. Vaccination, deworming, detecting deficiencies and	**Course No. LPM-311: Introductory Poultry Management (Credit Hours: 2+1=3)** **Theory** • Economic importance of poultry and development of poultry industry in India. • Different terms used in poultry science. • Different breeds and varieties of chicken and ducks. • Structure of egg, Egg formation – Formation of yolk, albumen and shell. • Handling, care and management of hatching eggs. • Different systems of housing of poultry; floor space requirements, construction details of poultry houses. • Care and management of chicks, pullets and cockerels; • Care and management of broilers and layers; • Feeds and feeding of broilers and layers; • Commercial hatcheries and its role in poultry development; • Disinfection of incubators, brooders, farm implement and poultry houses; • Introduction to integrated poultry farming • Vaccination and deworming in poultry **Practical** • Handing of poultry birds; • External body parts of birds; • Common Poultry Farm equipments

combating them etc. **Practical** Handing of poultry. External body part, identification of species, breeds and varieties of poultry. Reproductive and digestive systems of chicken, structure and a composition of eggs and meat, poultry judging, selection and selling of poultry, candling of eggs evaluation of quality, presence off blood and meat spots etc; measuring the strength of eggs, grading of eggs and management of incubators, sexing of chicks, brooding of chicks feeders, waterers, trap nests and poultry farm and hatchery equipments; different systems of housing and lay out plants for poultry farms of different sizes, feeds and feeding of broilers and layers, systems of feeding, slaughter and dressing of poultry, different methods of preservation of eggs and meat; health care and management of chicks, ducklings and turkey care and management of broilers and layers during summer and winter. Record keeping of poultry farm (including accounts). Preparation of feasibility reports for small and medium poultry farms. Preparation of projects reports for the same. Model scheme for a large poultry farm.	• Day to day management of layer birds • Day to day management of broiler birds • Debeaking in hen • Candling of Egg • Differentiation between cock and hen Different methods of preservation of eggs • Record keeping of poultry farm Preparation of feasibility reports on small and medium poultry farms. • Judging of layer birds

SIXTH SEMESTER	
Farm Practice Training: 1. Two months of cattle and buffalo 2. One month of sheep and goat 3. One month poultry 4. One months and three weeks of government dispensary 5. Seven days Educational tour 6. Report Writing	**Farm Practice Training:** • Cattle and buffalo farms • Sheep and goat farms • Poultry farm • Veterinary College/Veterinary Clinical Complex (VCC)/ Livestock Farm Complex (LFC) • Government dispensary/Co-operative dairy unit /Gaushala • Seven days Educational tour • Report Writing Note: The maximum duration for each center should not exceed 03 weeks. The selection of center as per regulation for Farm Practice Training for Diploma in Animal Husbandry course, 2016 {Appendix-1 (A) point no.09}