Shri Vishwanath P. G. College Kalan, Sultanpur

(Affiliated to)

DR. RAM MANOHAR LOHIA AVADH UNIVERSITY, AYODHYA

Structure of Syllabus for the Program: M.Sc. (Ag.)

Subject- Animal Husbandry & Dairying

SEMESTER-WISE TITLES OF THE PAPERS IN M. Sc. (Ag.) COURSES					
YEAR	**SEME-STER**	**COURSE CODE**	**PAPER TITLE**	**THEORY/ PRACTICAL**	**CREDIT**
DEGREE **IN MASTER OF SCIENCE IN AGRICULTURE (Animal Husbandry & Dairying))**					
FIRST YEAR	**I**	AHD-501	Production & Management of Dairy Animals	THEORY & PRACTICAL	3(2+1)
		AHD -502	Poultry Production & Management	THEORY & PRACTICAL	3(2+1)
		AHD-503	Market Milk Technology	THEORY & PRACTICAL	3(2+1)
		AS-501	Agricultural Statistics	THEORY & PRACTICAL	3(2+1)
	II	AHD 504	Fundamental of Animal Nutrition	THEORY & PRACTICAL	3(2+1)
		AHD- 505	Reproductive Physiology of Farm Animals	THEORY & PRACTICAL	3(2+1)
		AHD-506	Dairy Processing and plant management	THEORY & PRACTICAL	3(2+1)
		AHD-507	Feed Evaluation Techniques	THEORY & PRACTICAL	3(2+1)
SECOND YEAR	**III**	AHD-508	Microbiology of Milk & Milk Products	THEORY & PRACTICAL	3(2+1)
		AHD -509	Dairy Technology	THEORY & PRACTICAL	3(2+1)
		AHD-510	Fundamentals of Animal Breeding Genetics	THEORY & PRACTICAL	3(2+1)
		CA-502	Computer Application in Agriculture	THEORY & PRACTICAL	2(1+1)
		PGS -501	Library and Information Services (Non gradial)Satisfactory /unsatisfactory	PRACTICAL	(0+1)
	IV	AHD 591	Master Seminar	PRESENTATION	1(0+1)
		AHD- 599	Master Research (Thesis)	Research	20
OR					
Special papers (20 credits) satisfactory/unsatisfactory					
		AHD-511	Non-Ruminant Nutrition	THEORY & PRACTICAL	4(3+1)

		AHD -512	Dairy Farm Management	THEORY & PRACTICAL	4(3+1)
		AHD-513	Ruminant Nutrition	THEORY & PRACTICAL	4(3+1)
		AHD-514	Technology of Indian dairy products	THEORY & PRACTICAL	4(3+1)
		AHD 515	Production & management of Sheep, Goat, Swine and Poultry	THEORY & PRACTICAL	4(3+1)

Semester I

AHD-501: Production & Management of Dairy Animals 3 (2+1)

Theory :

Development of livestock industry in India and world, Present status and future prospectus of livestock development in India Important Bread of Buffalo, Cattle, Sheep and Goat, treats of economical importance, Housing and raring system, Breading management and method of breading pre nature and post nature care and management of cattle and buffalo, Management strategies for reducing mortality in calves, age at first calving and calving interval in cattle and buffalo, Management of labour, Milking Management, Transport of Animal, Health Management (Important Diseases like FMD, HS, Timpanty, Impaction of Rumen, Dystocia milk fever, Ketosis) Feed and Fodder resources and there uses for feeding. Specific technique of feeding and watering. Computation of Practical and Economical Ration, Supply of Green Fodder, Around the Year, Enrichment of Poor Quality Roughage.

Practical: Relevant to concerned theory topics

AHD-502: Poultry Production & Management 3 (2+1)

Theory-

Genetic Classification of Poultry Status of poultry industry in India, why poultry farming is too much important in our country Requirement of Protein, Energy, Vitamins, Minerals and Feed additives for layers and broilers. Feed ingredients and ingredients related to energy, protein, minerals and vitamins sources Care and management of starters, growers, layers, broilers and breeding stocks. The formation of an egg and endocrine regulatory mechanism involved. Incubation and hatching of egg. Development of embryo in egg and Incubation. Deworming and vaccination programme, causal organism, symptoms, prevention and control of some important diseases like Ranikhet, Pullorum, Marck disease, Coccidiosis, C.R.D. Fowl pox and Coryza Principals of Bio security, Form Sanitization and disinfection procedure, Layout and design of Housing and cages.

Practical: Relevant to concerned theory tonics.

AHD-503: Market Milk Technology 3 (2+1)

Theory:

Recent advances in marketing of milk in India. Agencies involved in the production & handling of market milk Methods of procurement of milk, payments & quality assessment by organoleptic and platform test" Methods of chilling of milk and transportation. Milk storage tanks, Maintenance and cleaning of equipments in receiving room and storage PTA standards for market milk, Preservatives commonly used in market milk Definition and technology of clean milk, safe milk, recombined milk, toned milk, filled milk and special milk production.

Importance of packaging of milk and different types of containers used, Recent advances in pricing and distribution of market milk, Problems of city milk supply.

Practical: Relevant to concerned theory topics.

AS- 501: Agricultural Statistics 3 (2+1)

Theory:

UNIT 1: Classification tabulation and graphical representation of data. Box-pion Descriptive statistics. Exploratory data analysis. Theory of probability Random variable and mathematical expectation.

UNIT 2:

Discrete and continuous probability distribution Binomial Poisson. Normal distribution, Concept of sampling distribution chi-square, t and F distributions Tests of significance based on Normal, chi-square, t and F distribution. Large sample theory.

UNIT 3:

Introduction to theory of estimation and confidence intervals, correlations and regression. Simple and multiple linear regression model estimation of parameters predicted value and residuals correlation coefficient, partial correlation coefficient, multiple correlation coefficient, rank correlation coefficient, test of significance of correlation coefficient and regression coefficient, coefficient of determination.

UNIT-4:

Need for designing of experiments, characteristics of a good design. Basic principles of designs, randomization, replication and local control

UNIT-5:

Uniformity trails, size and shape of plots and blocks, analysis of variance, completely randomized design. randomized block design and Latin squire design, missing plot tecliniques, split plot design

UNIT-6:

Sampling Techniques - Planning of survey, method of data collection, questionnaire vis schedule. Problems of sampling frame choice of sample of design, probabilly sampling. sample space, sampling design, simple random sampling. Estimation of proportion. confidence interval. Determination of sample size, stratified sampling, cluster sampling. multi state sampling systematic sampling, ratio and regression method of estimation, Non Sampling error-source and classification

Practical : Related with the course

Semester II

AHD-504 Fundamental of Animal Nutrition 3 (2+1)

Theory:

Composition of Animal body Digestive system of ruminant and non-ruminant animals, Ruminant Vs non-ruminant nutrition; Digestion and metabolism of various nutrients like crude fibre, crude fat, crude protein, minerals, vitamins and NPN compounds in ruminant animals Evaluation of feed in relation to protein and energy value. Nutrient requirements of farm animals like cattle and buffalo for various purposes like maintenance, growth, milk production, pregnancy, work and for service.

Practical: Relevant to concerned theory topics.

AHD-505: Reproductive Physiology of Farm Animals 3 (2+1)

Theory:

Anatomy of male and female reproductive tract. Physiology of endocrine mechanism involved in male reproduction such as sexual drive, spermatogenesis, hormones of testes, ejaculation and sperm transport Physiology and endocrine mechanism involved in female reproduction such as estrous cycle, oogenesis. ovulation and formation of corpusluteum (Physiology and endocrine mechanism involved in fertilization, implantation, maintenance of pregnancy, parturition, initiation and secretion of milk, let down and holding up of milk phenomena. Physiology and endocrine mechanism involved in puberty, mammary gland development and maintenance of lactation.

Practical: Relevant to concerned theory topics

AHD-506: Dairy Processing and plant management 3 (2+1)

Theory:

Processing of market milk pre-heating, filtration, clanification, purpose. principle, methods, homogenization, pasteurization, sterilization, uprization and bactofugation of milk. Cooling and storage of milk. Refrigeration and its importance in dairy industry; principles and systems of refrigeration, refrigerants; their uses and limitations, brine and its composition and maintenance Metals and materials commonly used in dairy industry, cleaning and sterilization of dairy utensils and equipments Requirements for dairy building constructions, importance of dairy plant layout. Factors to be considered in location of dairy plants, requirements, maintenance and upkeep of equipments for collection, transportation, storage, cooling, separation, homogenization, clarification, pasteurization and packaging of milk.

Practical: Relevant to concerned theory topics

AHD-507: Feed Evaluation Techniques **3 (2+1)**

Theory:

Classification of feeding stuffs. composition of feed, weende vs soest methods of analysis. digestibility and metabolic trials for various classes of animal rumen fistula techniques, artificial rumen experimentation, in-vitro and in-vivo studies.

Practical: Relevant to concerned theory topics

Semester III

AHD-508: Microbiology of Milk & Milk Products 3 (2+1)

Theory:

Micro-organism in milk. Milk as a nutrients media, for bacterial growth, inhibitory substances in milk. Sources of contamination during production, handling and distribution of milk Important groups of bacteria occurring in milk. Thermoduric and thermophilic bacteria, activities of different species in milk principles involved in sanitary milk production. Routine bacteriological tests for quality control of market milk. Transmission of diseases of bovine and human origin through milk and milk products. Bacteriology of milk products, role of lactic acid bacteria and other micro-organisms in the manufacture of butter, cheese and fermented milk. Spoilage of various milk products by micro- organisms. Bacteriology of starter culture,

Practical: Relevant to concerned theory topics.

AHD-509: Dairy Technology 3 (2+1)

Theory :

Status of dairy industry in India. Operation flood programme technology mission on dairy National milk grid, marketing federation, their concept, achievement limitation and impact on the dairy industry in India. Recent policy changes to dairy sector (MMPO GATT) and their impact on dairy industry in India. Importance of various milk processing techniques, significance and role of indigenous dairy product in Indian Dairy Industry and economy Characteristics and composition of various indigenous products, their prospects and constraints. Basic principles of processing and quality aspect of different cream table half and half sterilized and high fat cream Quality aspect and safe life.

Practical: Relevant to concerned theory topics.

AHD-510: Fundamentals of Animal Breeding Genetics 3 (2+1)

Theory:

Genetics Its importance in animal breeding. Mendelian laws and its modified ratios-gene interaction Lethal factor, qualitative & quantitative heredity linkage and its importance in livestock improvement, inheritance of sex linkage, sex influenced and sex Imited traits. Gene frequency, factors affecting gene frequency Breeding Inbreeding, its genotypic effect, measurement of relationship and coefficient of inbreeding Out crossing and its importance, selective vs cross breeding, heterosis in milk production traits, grading up and species hybridization Artificial insemination and its importance collection of semen, handling and evaluation of semen Dilation of semen, preservation and storage of semen, and insemination

Practical : Relevant to concerned theory topics

CA-502: Computer Application in Agriculture 2 (1+1)

Theory:

Introduction to computer, operating system, definition and types, application of MS-Office for document creation & editing, data presentation, interpretation and gra creation, statistical analysis, mathematical expressions, database concepts and types, us of DBMS in Agriculture, World Wide Web (WWW), Memory, Hasic Army Computer System. e-Agriculture concepts and appleations, Use of ICT in Agriculture 11 Application for computation of water and nutrient requirement of crops computer controlled devices (automated system) for agri-input management, smart phone apps in Agriculture. Decision support systems, concepts components and applications in agriculture.

Practical: Study of computer components, accessories, practice of important DOS Commands Introduction of different operating system such as window, files & folders, file management. Use of MS-Word and MS Power-point for creating, editing and presenting a scientific document. MS-Excel - Creating a spreadsheet, use for statistical tools, writing expressions, creating graphs, analysis of scientific data. MS-Access-Creating database

PGS- 501: Library and Information Services (Non Gradial Satisfactory /unsatisfactory) 1(0+1)

Practical:

Introduction to library and its services, Role of libraries in education, research and technology transfer. Classification systems and organization of library: Sources of informa tion-primary sources secondary sources and tertairy sources: Intricacies of abstracting and indexing services (Science Citation Index, biological abstracts, chemical abstract, CABI abstracts, etc.), Tracing information from reference sources Literature survey: Citation tech- niques/Preparation of bibliography: Use of CD-ROM Databases, Online Public Access Cata- logne and other computerized library services; Use of Internal including search engines and its resources, e-resources acccis methods.

Semester IV

AHD- 591 Master Seminar **1 (0+1)**

Master seminar topic or title related to animal husbandry & dairying would be decided by advisory committee.

AHD 599 Master Research (Thesis) **20 (0+20)**

Master research (thesis) topic or title related to animal husbandry & dairying would be decided by advisory committee.

OR

Special Papers – (20-Credits) Satisfactory /Unsatisfactory

AHD-511: Non-Ruminant Nutrition **4 (3+1)**

Theory:

The role of non-ruminant animals, study of their digestive tract. Monogastic animal nutrition in a historical perspective, carbohydrate. lipid ind protein nutrition. translation of feeding standards into meal mixture. Physiological roles, deficiency symptoms and require- ments of vitamins and minerals. Mode of action and effect of feed additives on animal performance. Feeding standards, methods of measuring the nutrient needs and efficiency of feed utilization.

Practical : Relevant to concerned theory topics**.**

AHD-512: Dairy Farm Management **4 (3+1)**

Place of dairy farming in the national economy, consideration in establishment of a dairy farm enterprise, types and arrangements of dairy buildings, dairy housing and equipment Care and management of calves, heifers, lactating, dry and pregnant cows and buffaloes, dairy bulls and bullocks; forage production, feeding guides for various categories of dairy animals, tips of breeding efficiency management, herd health management, dairy record management and marketing by dairy animals and products.

Practical : Relevant to concerned theory topics.

AHD 513: Technology of Indian Dairy products 4 (3+1)

Theory:

The role of ruminant animals, studey of their digestive tract. Its development, rumen environment, ruminal movements, role of microbes and manipulation of rumen eco-system. Ingestion of food, passage of digestation through GIT, theories of regulation of feed intake digestion and metabolism of carbohydrates, introgenous compunds and lipids. Synthesis of lactose, glycerol, long chain fatty acids and non-essential amino-acids, composition of protein and its biological value. Study of problems associated with non-protein introgenous substances utilization. Water metabolism and requirements. Energy nutrition of rumen micro-organisms, manipulation of rumen fermentation, energy metabolism of host animal, host animal control of microbial fermentation and utilization of the energy of absorbed nutrients. Vitamin and mineral nutrition, function, metabolism, deficiency symptoms and their sources, inter-relationships between vitamins and minerals.

Practical : Relevant to concerned theory topics.

AHD 514 Production and Management of sheep, Goat, swine & poultry 4 (3+1)

Theory:

Present trend of production of Indian dairy products. Comparison with Western dairy products. Concentrated products: definition, composition and method of preparation of khoa and rabri; Uses and keeping quality of khoa. Ghee composition, indigenous and improved practices of ghee making, grading of ghee under AGMARK. Coagulated milk products: definition, composition and methods of manufacture of chhena and paneer. Fermented milk products: definition, composition and method of preparation of Dahi, Srikhand, Yoghurt.

Practical : Relevant to concerned theory topics.

AHD-515: PRODUCTION AND MANAGEMENT OF SHEEP, GOAT, SWINE & POULTRY 4(3+1)

Theory

Sheep & Goat- Important breeds of sheep & goat and their traits of economic importance, reproduction and breeding-system management in sheep & goat. Nutrients requirement and feeding practice for economic raising of sheep & goat. Routine operation. housing, care of kid & lamb, scope at intensive milk, meat, mutton & wool production. Low cost shalter management of sheep & goat Health management package.

Swine-Piggery development programme in India. Characteristic of swine and their production. Breeds reproduction & their problems management, housing, nutrition, nutrients requirement and

feeding of swine. Care & management of pregnant sow and unweaned piglet, future of pig production programme in India with special reference to weaker section of society.

Poultry- The digestive and reproductive system of fowl Formation of eggs Structure and nutritive value of egg. Egg producing carrier of a laying hen and factors affecting egg size. Abnormal eggs. Hatching of eggs. Management of incubator & light Breeding & rearing management of chick in brooders. Housing equipment housing requirements. Housing system of poultry Feeds. Method of feeding. Computation & mixing of ration. Use of agro-industrial by products in poulty feeding. Management of replacement pullets, Culling of laying flocks. Maintenance of farms records Health & sanitation problem & their control. Strategy to promote back yard poultry farming commercial.

Practical: Relevant to concerned theory topics.