

## Academic:

1. Course offered :: UG, PG , PhD - Semester / Year wise

- List of UG Courses ( B.V.Sc & AH ) As per latest MSVE Guidelines) , B.Tech. (D.T.) and B.F.Sc as per ICAR – V Deans Committee – 2016.

Sr No	Course No.	Title	Credit	Course offered in the Year
	<b>Unit No</b>	<b>Topic</b>	<b>No of Lectures Theory</b>	
	<b>Unit-1</b>	General Livestock Management	14	I
	<b>Unit-2</b>	Fodder Production and Conservation	11	I
	<b>Unit-3</b>	Livestock Production Management – Ruminants	17	I
	<b>Unit-4</b>	Zoo Animals Production Management	12	I
	<b>Unit-5</b>	Animal Welfare	14	I
	<b>Unit-6</b>	Poultry Production Management	22	I
	<b>Unit-7</b>	Diversified Poultry Production and Hatchery Management	12	I
	<b>Unit-8</b>	Laboratory or Rabbit or Pet Animal Production Management	14	I
	<b>Unit-9</b>	Swine or Equine or Camel, Yak and Mithun Production Management	14	I

	<b>Unit No</b>	<b>Topic</b>	<b>No of Lectures Practical</b>	
	<b>Unit-1</b>	General Livestock Management	12	I
	<b>Unit-2</b>	Fodder Production and Conservation	6	I
	<b>Unit-3</b>	Livestock Production Management – Ruminants	11	I
	<b>Unit-4</b>	Zoo Animals Production Management	6	I
	<b>Unit-5</b>	Poultry Production Management	11	I
	<b>Unit-6</b>	Incubation and Hatchery Management	6	I
	<b>Unit-7</b>	Laboratory or Rabbit or Pet Animal Production Management	7	I
	<b>Unit-8</b>	Swine or Equine or Camel, Yak and Mithun Production Management	6	I

➤ List of PG Courses ( MVSc ) and M.Tech. (Dairy Technology)

<b>Sr No</b>	<b>Course No .</b>	<b>Title</b>	<b>Credit</b>	<b>Semester</b>
1.	LPM-601	Cattle and Buffalo Production and Management	2+1	I
2.	LPM-602	Sheep and Goat Production and Management	2+1	II
3.	LPM-603	Swine Production and Management	1+1	III

4.	LPM-604	Laboratory Animal Production and Management	1+1	IV
5.	LPM-605	Shelter Management	1+1	V
6.	LPM-606	Principles of Environmental Hygiene and Waste Management	2+0	VI
7.	LPM-607	Climatology and Animal Production	1+0	VII
8.	LPM-608	Poultry Farm and Hatchery Management	2+1	VIII
9.	LPM-609	Farm Animal Behavior	1+0	IX
10.	LPM-610	Integrated Livestock Farming System	2+1	X
11.	LPM-611	Equine Production and Management	1+1	XI
12.	LPM-612	Wild Life Management and Conservation	2+0	XII
13.	LPM-613	Livestock Business Management	1+1	XIII
14.	LPM-691	Master's Seminar	1+0	XIV
15.	LPM-699	Master's Research	20	XV
16.	PGS 506	Disaster management	1+0	XVI

2. Lecture Schedule – UG, PG , PhD - Theory / Practical Schedule – Approved by BoS – Subject wise

### **THEORY**

#### **Unit – 1**

**Title : General Livestock Management**

**Total Theory Lectures: 14**

S. N.	Topic	Date	Day	
1	Demographic distribution of livestock & role in Indian economy; Problems & prospects of livestock industry in India	28 Oct	Monday	Dr. B. M. Khati
2	Animal holding & land holding patterns in different agro-climatic zones	11Nov	Monday	Dr. B. M. Khati
3	Introduction to Livestock Production systems including Organic livestock production	18Nov	Monday	Dr. B. M. Khati

4	Common animal husbandry terms related to cattle, buffalo	25Nov	Monday	Dr. B. M. Khati
5	Common animal husbandry terms related to sheep, goat, pig	02 Dec	Monday	Dr. B. M. Khati
6	Common animal husbandry terms related to horse, camel, yak & mithun	09 Dec	Monday	Dr. B. M. Khati
7	Body conformation & methods of identification in livestock	16 Dec	Monday	Dr. B. M. Khati
8	Transportation of livestock & wild/zoo animals	23 Dec	Monday	Dr. B. M. Khati
9	Common farm management practices including disinfection, isolation, quarantine & disposal of carcasses	30 Dec	Monday	Dr. B. M. Khati
10	Common farm management practices including disinfection, isolation, quarantine & disposal of carcasses	06 Jan	Monday	Dr. B. M. Khati
11	Introduction to the methods of drug administration.	12 Jan	Monday	Dr. B. M. Khati
12	Common vices of animals (cattle, buffalo, sheep & goat), their prevention and care	20 Jan	Monday	Dr. B. M. Khati
13	Preparation of animals for show, Judging & BCS for body parts of livestock	27 Jan	Monday	Dr. B. M. Khati
14	Culling of animals; Selection & purchase of livestock	03 feb	Monday	Dr. B. M. Khati

**PRACTICAL Unit – 1 Title : General Livestock Management Total Practicals: 12**

S. N.	Topic	Date	Time	
1	General introduction of the Institute animal farm	22-24Oct	14:00 – 16:00	Dr. B. M. Khati
2	Identification of common tools used on animal farm	22 -24Oct	16:00 – 18:00	Dr. B. M. Khati
3	Familiarization of body points of animals Cattle & Buffalo	25-28 Nov	14:00 – 16:00	Dr. B. M. Khati
4	Familiarization of body points of animals Sheep, Goat, Pig & Horse	25-28 Nov	16:00 – 18:00	Dr. B. M. Khati
5	Methods of Identification (marking, tattooing, branding, tagging & electronic chip)	23-26 Dec	14:00 – 16:00	Dr. B. M. Khati
6	Approaching and handling of animals. Use of rope for knot & halter making.	23-26 Dec	16:00 – 18:00	Dr. B. M. Khati
7	Dentition & ageing of animals Cattle & Buffalo	27-30 Jan	14:00 – 16:00	Dr. B. M. Khati
8	Dentition & ageing of animals Sheep, Goat, Pig & Horse	27-30 Jan	16:00 – 18:00	Dr. B. M. Khati
9	Preparation of animals for show, judging, fairs and melas	24-27 Feb	14:00 – 16:00	Dr. B. M. Khati
10	Selection and culling of animals	24-27 Feb	16:00 – 18:00	Dr. B. M. Khati

11	Preparation of project proposal Cattle & Buffalo	24-27 Mar	14:00 – 16:00	Dr. B. M. Khati
12	Preparation of project proposal Sheep & Goat	24-27 Mar	16:00 – 18:00	Dr. B. M. Khati

## Unit – 2

### Title :Fodder Production & Conservation

#### Total Theory Lectures: 11

S. N.	Topic	Date	Day	
1	Importance of grasslands and fodder in livestock production.	22 Oct	Tuesday	Dr. G. P. Shende
2	Agronomical Practices for fodder production- Environment, soil type, Land preparation, sowing time, sowing method, seed rate, manure/fertilizer, irrigation, weed control, harvesting time,method and yield.	29 Oct	Tuesday	Dr. G. P. Shende
3	Agronomical Practices for fodder production-cereal fodder-Kharif and summer season - Jowar,Bajra,MaizeRabi season -Teosinte and Oats	12 Nov	Tuesday	Dr. G. P. Shende
4	Agronomical Practices for fodder production of annual and perennial grass fodder- Hybrid Napier,Guinea grass, Para grass, Deenanath, Marvel grass, Rhodes grass, Sudan grass and Anjan grass	19 Nov	Tuesday	Dr. G. P. Shende
5	Agronomical Practices for fodder production -Legume crops Kharif and summer season -Cowpea, Rice bean Velvet bean, Guar and Soyabean	26 Nov	Tuesday	Dr. G. P. Shende
6	Agronomical Practices for fodder production-Legume crops Rabi season -Lucerne, Berseem, Metha and Senji	10 Dec	Tuesday	Dr. G. P. Shende
7	Soil and Water conservation and drainage of water for fodder production.	17 Dec	Tuesday	Dr. G. P. Shende
8	Fodder production for small livestock units (backyard cultivation, intercropping, fodder production on waste land/low lying area bunds, charies, canals, azolla& hydroponics)	24 Dec	Tuesday	Dr. G. P. Shende
9	Structures for storage of feeds and fodders.	31 Dec	Tuesday	Dr. G. P. Shende
10	Preservation of green fodder- Silage and Hay making Scarcity fodder trees- Acacia,Banyan, Peepal, Glyciridia, Mango, Neem, Tamarind, Bilayati ,Subabool, Other sources- Failed crops, Crop residues , Plant oriented wastes, Agro- Industry wastes	07 Jan	Tuesday	Dr. G. P. Shende
11	Recycling of animal washings and wastes in fodders production and use of recycle waste.	21 Jan	Tuesday	Dr. G. P. Shende

## Unit – 2

### Title :Fodder Production & Conservation

#### Total Practicals: 6

S. N.	Topic	Date	Time	
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1	Visit to the fodder farm. Familiarization with the various types of fodders in the state and India.	02-05 Dec	14:00 – 16:00	Dr. G. P. Shende
2	Familiarization with various fertilizers and manures	02-05 Dec	16:00 – 18:00	Dr. G. P. Shende
3	Collection, preservation and storage of feed and fodder	06-09 Jan	14:00 – 16:00	Dr. G. P. Shende
4	Damages or loss during transport and storage; methods to prevent them	06-09 Jan	16:00 – 18:00	Dr. G. P. Shende
5	Cost of calculations of fodder production.(One Cereal & one legume crop)-----	03-06 Feb	14:00 – 16:00	Dr. G. P. Shende
6	Livestock waste utilization and recycling.	03-06 Feb	16:00 – 18:00	Dr. G. P. Shende

**Unit – 3 Title: Livestock Production Management-Ruminants****Total Theory Lectures: 17**

<b>Sr.</b>	<b>Topic</b>	<b>Date</b>	<b>Day</b>	
1	Housing systems, layout and design of different buildings for animals	25 Oct	Friday	Dr.B. M. Khati
2	Selection of site. General principles affecting the design and construction of building for housing of cattle & buffalo.	22 Nov	Friday	Dr. B. M. Khati
3	Selection of site. General principles affecting the design and construction of building for housing of Sheep & Goat.	29 Nov	Friday	Dr. B. M. Khati
4	Building materials used for construction of wall, roof and floor of animal houses, their characteristics, merits and demerits. Utilization of local materials.	06 Dec	Friday	Dr. B. M. Khati
5	Arrangements of the building with special reference to Indian conditions.	13 Dec	Friday	Dr. B. M. Khati
6	Breeds of cattle and buffalo and descriptions of important breeds.	20 Dec	Friday	Dr. B. M. Khati
7	Economic traits of cattle and buffaloes.	27 Dec	Friday	Dr. B. M. Khati
8	General management and feeding practices of calves, heifers, pregnant and lactating animals.	03 Jan	Friday	Dr. B. M. Khati
9	General management and feeding practices of dry animals, bulls and working animals.	10 Jan	Friday	Dr. B. M. Khati
10	Draught ability of cattle and buffaloes.	17 Jan	Friday	Dr. B. M. Khati
11	Raising of buffalo males for meat production	24 Jan	Friday	Dr. B. M. Khati
12	Routine animal farm operations and labour management	31 Jan	Friday	Dr. B. M. Khati
13	Animal farm accounts and records.	07 Feb	Friday	Dr. B. M. Khati
14	Methods of milking and precautions. Factors affecting quality and quantity of milk production. Clean milk production	14 Feb	Friday	Dr. B. M. Khati
15	Breeds of sheep and goat and their descriptions. Important economic traits for meat, milk and fibre.	21 Feb	Friday	Dr. B. M. Khati
16	General management and feeding practices during different stages of growth, development and production (milk, meat and wool).	28 Feb	Friday	Dr. B. M. Khati

17	Breeding schedule and management of ram and buck. Weaning and fattening of lambs and kids	07 Mar	Friday	Dr. B. M. Khati
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### Unit – 3 Title: Livestock Production Management-Ruminants

#### Total Practicals: 11

S. N.	Topic	Date	Time	
1	Layout plans for different livestock houses	18-21 Nov	14:00 – 16:00	Dr. B. M. Khati
2	Visit to different animal farms and Identification of various breeds of cattle, buffalo, sheep and Goat	18-21 Nov	16:00 – 18:00	Dr. B. M. Khati
3	Humane handling , restraining & casting of cattle, buffalo, sheep and Goat	16-19 Dec	14:00 – 16:00	Dr. B. M. Khati
4	Clipping, shearing, dipping, spraying and spotting sick animals.	16-19 Dec	16:00 – 18:00	Dr. B. M. Khati
5	Determination of body weight using different measurements.	20-23 Jan	14:00 – 16:00	Dr. B. M. Khati
6	Familiarization with routine cattle, buffalo, sheep and goat farm operations	20-23 Jan	16:00 – 18:00	Dr. B. M. Khati
7	Milking of dairy animals.	17-20 Feb	14:00 – 16:00	Dr. B. M. Khati
8	Training of breeding males	17-20 Feb	16:00 – 18:00	Dr. B. M. Khati
9	Detection of heat. Identification and care of pregnant animals, care of neonatal and young stock	17-20 Mar	14:00 – 16:00	Dr. B. M. Khati
10	Economics of dairy farm.	17-20 Mar	16:00 – 18:00	Dr. B. M. Khati
11	Economics of sheep or goat farm	14-17 Apr	14:00 – 16:00	Dr. B. M. Khati

### Unit – 4

#### Title: Zoo Animals Production Management

#### Total Theory Lectures: 12

S. N.	Topic	Date		
1	Taxonomy of important wild zoo animals.	28 Jan	Tuesday	Dr. G. P. Shende
2	Taxonomy of important wild zoo animals.	04Feb	Tuesday	Dr. G. P. Shende
3	Status and conservation practices of wild life in India.	11 Feb	Tuesday	Dr. G. P. Shende
4	Basic principles of habitat and housing of various classes of wild zoo animals.	18 Feb	Tuesday	Dr. G. P. Shende



5	Size and space requirement (dimension) of cubicles, enclosures of important wild zoo animals.	25Feb	Tuesday	Dr. G. P. Shende
6	Management of livestock in fringe areas, in and surrounding the breeding areas.	04Mar	Tuesday	Dr. G. P. Shende
7	Feeding habits of captive animals.	11Mar	Tuesday	Dr. G. P. Shende
8	Feeds and feeding schedules of captive animals.	18Mar	Tuesday	Dr. G. P. Shende
9	Restraining, capture, handling, physical examination of captive animals.	25Mar	Tuesday	Dr. G. P. Shende
10	Classification of zoos, general management practices of sanctuaries, national parks etc.	01 Apr	Tuesday	Dr. G. P. Shende
11	Acts and Rules related to captive animals.	08 Apr	Tuesday	Dr. G. P. Shende
12	National and international organization and institutions interlinked to captive animals role and functioning.	15 Apr	Tuesday	Dr. G. P. Shende

#### **Unit – 4**

**Title :Zoo Animals Production Management**

**Total Practicals: 6**

S. N.	Topic	Date	Time	
1	Visit to nearby wildlife sanctuary/zoo, captive animals centres to study care and management of these animals.	03-06 Mar	14:00- 16:00	Dr. G. P. Shende
2	To study housing of captive animals.	03-06 Mar	16:00- 18:00	Dr. G. P. Shende
3	To study feeds and feeding schedule of captive animals.	31 Mar-03Apr	14:00- 16:00	Dr. G. P. Shende
4	Hygienic preparation, preservation and storage of feeds of captive animals.	31 Mar-03 Apr	16:00- 18:00	Dr. G. P. Shende
5	Familiarization about restraining, handling of captive animals.	05-08May	14:00- 16:00	Dr. G. P. Shende
6	Physical examination of captive animals.	05-08 May	16:00- 18:00	Dr. G. P. Shende

#### **Unit – 5**

**Title : Animal Welfare**

**Total Theory Lectures: 14**

S. N.	Topic	Date		
1	Definition of animal welfare and ethics. Human and animal welfare in relation to ecosystem and environmental factors.	22 Apr	Tuesday	Dr. G. P. Shende
2	Role of veterinarians in animal welfare.	29 Apr	Tuesday	Dr. G. P. Shende

3	List of Animal welfare organizations. Animal Welfare Board of India - their role, functions and current status.	06 May	Tuesday	Dr. G. P. Shende
4	Rules, regulations, laws on animal welfare. Prevention of Cruelty to Animals (PCA) Act, 1960 {59 of 1960}	13 May	Tuesday	Dr. G. P. Shende
5	Role and function of Committee for the Purpose of Controlling and Supervising Experiments in Animals (CPCSEA).	20 May	Tuesday	Dr. G. P. Shende
6	Protection of wild life in nature and captivity.	27 May	Tuesday	Dr. G. P. Shende
7	Protection and welfare of performing animals.	03 Jun	Tuesday	Dr. G. P. Shende
8	Welfare of animals during transportation.	10 Jun	Tuesday	Dr. G. P. Shende
9	Animal welfare in commercial livestock farming practices. Protection and welfare of working animals.	17 Jun	Tuesday	Dr. G. P. Shende
10	Pet and companion animal welfare.	24 Jun	Tuesday	Dr. G. P. Shende
11	Animal welfare during natural calamities and disaster management.	01 Jul	Tuesday	Dr. G. P. Shende
12	Legal duties of veterinarians, Common offences against animals and laws related to these offences.	08 Jul	Tuesday	Dr. G. P. Shende
13	Provincial and Central Acts relating to animals. Laws relating to offences affecting Public Health.	15 Jul	Tuesday	Dr. G. P. Shende
14	Livestock Importation Act Evidence, liability and insurance. Code of Conduct and Ethics for veterinarians - the Regulations made under the Act.	22 Jul	Tuesday	Dr. G. P. Shende

**Unit – 6 Title : Poultry Production Management Total Theory Lectures: 22**

Sr.	Topic	Date	
1	Indian poultry industry – Brief outline of the different segments – poultry statistics Classification of poultry with respect to production characters, age and standards		Friday
2	Production characters of other avian species		Friday
3	Description of indigenous fowls and their value in rural farming. Specific strains developed for rural poultry production; their acceptability and importance in rural eco-system		Friday
4	Housing –Types of poultry houses – space requirements. Recent advances in housing systems and rearing systems.		Friday
5	Scavenging system of management – Low input technology – Backyard and semi-intensive units; their management and economic achievements.		Friday
6	Deep litter management – control of litter-borne diseases and recycling of litter.		Friday
7	Brooding management – Types of brooders – preparation of shed – Importance of environmental factors		Friday
8	Cage management – Different types; Advantages and disadvantages.		Friday
9	Management of growers		Friday
10	Management of layers.		Friday
11	Management of broilers		Friday
12	Management of breeders.		Friday
13	Stress management, Water management		Friday
14	Feeding management–Classification of nutrients		Friday
15	Nutrient requirements and feed formulations.		Friday
16	Feeding systems–Feed restrictions – phase feeding – Additives and supplements.		Friday
17	Breeding systems and methods of mating. Breeding for specific characters and for hybrid chicken production.		Friday
18	Selection and culling. Poultry judging. Egg structure – Physical and chemical composition.		Friday
19	Common poultry diseases : Bacterial and viral diseases, Coccidiosis		Friday

20	Common poultry diseases : Metabolic and Deficiency diseases		Friday
21	Bio-security and principles of disease prevention management.		Friday
22	Health care for common poultry diseases – vaccination. General principles of poultry medication.		Friday

**Unit – 5 Title : Poultry Production Management Total Practicals: 11**

Sr.	Topic	Date	Time
1	Common breeds of poultry, different classes	11-14 Nov	14:00- 16:00
2	Indian chickens and other avian species breeds.	11-14 Nov	16:00- 18:00
3	Digestive and respiratory system of chicken., Male and female reproductive system–Egg structure, physical and chemical composition, Quality changes in egg during storage.	09-12 Dec	14:00- 16:00
4	Economic traits of broilers. Economic traits of egg-type chicken and breeders. AI in poultry.	09-12 Dec	16:00- 18:00
5	Housing and design of a poultry farm, Automization in poultry farms (EC house).	06-09 Jan	14:00- 16:00
6	Poultry farm equipment and their classification.	06-09 Jan	16:00- 18:00
7	Brooding arrangement in broiler farms.	10-13 Feb	14:00- 16:00
8	Poultry feed ingredients and its quality assessment. Poultry feed preparations.	10-13 Feb	16:00- 18:00
9	Calculation of different economic indices of broiler farm. Calculation of economic indices of layer farm.	10 -13 Mar	14:00- 16:00
10	Fundamentals in poultry Post-mortem examination for sample collection. Collection and dispatch of samples for PM examination.	10 -13 Mar	16:00- 18:00
11	Management during Summer, Winter and Rainy season.	07 -10 Apr	14:00-16:00

**Unit – 7**

**Title : Diversified Poultry Production And Hatchery Management**

**Total Theory Lectures: 12**

S. N.	Topic	Date	
1	Principles of incubation, Hatchery management practices		Friday

2	Factors affecting fertility and hatchability		Friday
3	Selection and care of hatching eggs and Hatchery hygiene, Candling, sexing, grading, packing and disposal of hatchery waste.		Friday
4	Economics of hatchery business – Troubleshooting hatchery failures–Computer applications in hatchery management.		Friday
5	Poultry waste management, Pollution and environmental issues.		Friday
6	Organic and hill farming.		Friday
7	Mixed or integrated poultry farming, Vertical & horizontal integration in commercial poultry production – Contract farming.		Friday
8	Export import of poultry produce and marketing.		Friday
9	Management of Ducks.		Friday
10	Management of Japanese quails.		Friday
11	Management of Turkeys.		Friday
12	Management of Geese and Guinea fowls.		Friday

#### **Unit – 6**

**Title :Incubation And Hatchery Management**

**Total Practicals: 06**

<b>S. N.</b>	<b>Topic</b>	<b>Date</b>	<b>Time</b>
1	Hatchery layout and design.	07 -10 Apr	14:00- 16:00
2	Project report for establishing a broiler farm.	12-15 May	16:00- 18:00
3	Project report for establishing a layer farm.	12-15 May	14:00- 16:00
4	Project report for establishing a breeder farm.	09 -12 Jun	16:00- 18:00
5	Visit to commercial poultry farms or hatchery or feed mill.	09 -12 Jun	14:00- 16:00
6	Visit to farms of other avian species.	07-10 Jul	16:00- 18:00

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**Unit – 8****Title :Laboratory Or Rabbit Or Pet Animal Production Management****Total Theory Lectures: 14**

Sr.	Topic	Date		
1	Importance of lab animals in research and selection of laboratory animals for research.	10 Feb	Monday	Dr. B. M. Khati
2	Care and housing standards of mice, rats, hamster, guinea pigs & rabbit.	17 Feb	Monday	Dr. B. M. Khati
3	General considerations on feeding and breeding of laboratory animals.	24 Feb	Monday	Dr. B. M. Khati
4	Concept of production of specific pathogen free and germ free laboratory animals.	03 Mar	Monday	Dr. B. M. Khati
5	Scope of rabbit farming in the country, breeds and their distributions in India. Limitation of rabbit animal production. Selection, care and management of breeding stock for commercial purpose.	10 Mar	Monday	Dr. B. M. Khati
6	Identification, care and management of kindling animals. Care of new born, growing stock.	17 Mar	Monday	Dr. B. M. Khati
7	Breeding and selection techniques for optimal production of rabbit.	24 Mar	Monday	Dr. B. M. Khati
8	Feeds and feeding for rabbit production.	06 Apr	Monday	Dr. B. M. Khati
9	Hygienic care and Housing for rabbit production. Disposal, utilization and recycling of waste etc.	21 Apr	Monday	Dr. B. M. Khati
10	Preparing projects for micro (Backyard), mini and major rabbit farms.	28 Apr	Monday	Dr. B. M. Khati
11	Important breeds of dogs, cats and pet birds.	05 May	Monday	Dr. B. M. Khati
12	Feeding of dogs, cats and pet birds.	19 May	Monday	Dr. B. M. Khati
13	Dog show: preparation for show, kennel clubs, important characteristics for judgment.	26 May	Monday	Dr. B. M. Khati
14	Utility of dogs- guarding, defense, patrolling, riot control, scouting, espionage, mine detection, tracking, guiding, hunting, races, retrieving rescue and other uses.	02 Jun	Monday	Dr. B. M. Khati

**Unit – 7****Title :Laboratory Or Rabbit Or Pet Animal Production Management****Total Practicals: 07**

Sr.	Topic	Date	Time	
1	Identification of body parts and handling, weighing, sexing and weaning of laboratory animals.	21-24 Apr	14:00- 16:00	Dr. B. M. Khati
2	Marking for identification of laboratory animals for purpose of their individual recording. Maintenance of breeding records of laboratory animals.	21-24 Apr	16:00- 18:00	Dr. B. M. Khati
3	Computation, feeding schedule of balanced diet for high breeding efficiency of laboratory animals. Prophylactic measures against common disease of laboratory animals. Hygienic care and control of parasites.	26-29 May	14:00- 16:00	Dr. B. M. Khati
4	Shearing of rabbit. Feeding and Housing requirement and equipments for rabbit. Projects report for establishing of rabbit farm.	26-29 May	16:00- 18:00	Dr. B. M. Khati

5	Handling and restraining of dog, cat and pet bird and equipments for pet animals and birds.	23-26 June	14:00- 16:00	Dr. B. M. Khati
6	Brushing or grooming and bathing of dogs and cats. Nail and tooth care, clipping of hairs for show purpose.	23-26 June	16:00- 18:00	Dr. B. M. Khati
7	Care of pups, kitten and weaning.	21-24 Jul	14:00-16:00	Dr. B. M. Khati

#### Unit – 9

#### Title :Swine Or Equine Or Camel, Yak And Mithun Production Management

#### Total Theory Lectures: 14

Sr.	Topic	Date		
1	Introduction and scope of swine farming in the country. Demography of swine population.	21 Mar	Friday	Dr. B. M. Khati
2	Selection and breeding techniques in swine. Important breeds (exotic and indigenous) & their characteristics.	28 Mar	Friday	Dr. B. M. Khati
3	Housing and feeding of swine.	04 Apr	Friday	Dr. B. M. Khati
4	Management of breeding and pregnant sows; sows at farrowing and after farrowing:	11 Apr	Friday	Dr. B. M. Khati
5	Management of pig-lets, growing stock, lactating sows, and feedlot stock.	25 Apr	Friday	Dr. B. M. Khati
6	Equine population of India. Horses, donkeys and mules and their utility. Identification of breeds of horses, colors and markings.	02 May	Friday	Dr. B. M. Khati
7	Dentition & ageing of horses .Care and routine management of equines including grooming, saddling and exercise.	09 May	Friday	Dr. B. M. Khati
8	Stable and its management. Vices of horses. Foot care and shoeing care of horses.	16 May	Friday	Dr. B. M. Khati
9	Feeding routine for horse, donkeys and mules. Care of stallion.	23 May	Friday	Dr. B. M. Khati
10	Mating of horses, brood mare and its care. Foaling and care of newborn.	30 May	Friday	Dr. B. M. Khati
11	Breeding mules. Care of race horses and preparing horses for show. Doping and its detection. Colic and its prevention.	06 Jun	Friday	Dr. B. M. Khati
12	Common breeds of camel in India and their utility, peculiarities in camel. Feeding schedule of camel, rutting symptoms in camel.	13 Jun	Friday	Dr. B. M. Khati
13	Vices of camel. Care of breeding in camel, pregnancy and parturition of camel.	20 Jun	Friday	Dr. B. M. Khati
14	Population statistics and utility, peculiarities of yak. Feeding and breeding of Mithun or Yaks. Yak × cattle crossing, hybrids from Mithun or Yaks and their adaptation to high altitude, milk composition of Mithun or Yaks.	27 Jun	Friday	Dr. B. M. Khati

#### Unit – 8

#### Title :Swine Or Equine Or Camel, Yak And Mithun Production Management

#### Total Practicals: 06

Sr.	Topic	Date	Time	
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1	Handling and restraining of swine, equine and camels.	19-22 May	14:00- 16:00	Dr. B. M. Khati
2	Identification of pregnant animals, care during pregnancy, isolation and care of farrowing sows and piglets.	19-22 May	16:00- 18:00	Dr. B. M. Khati
3	Preparation of swine and equine for show and judging.	16 -19 Jun	14:00- 16:00	Dr. B. M. Khati
4	Preparation of plans for sty and stables. Economics of pig farming.	16 -19 Jun	16:00- 18:00	Dr. B. M. Khati
5	Routine inspection of pig, tooth care and Vaccination schedule of pig	14-17 Jul	14:00- 16:00	Dr. B. M. Khati
6	Horse riding, walking, trotting cantering and galloping.	14-17 Jul	16:00- 18:00	Dr. B. M. Khati

Teaching Schedule :UG, PG , PhD - Prepared by – Course Teacher – Year wise / Course Wise

## **THEORY**

### **Unit – 1**

**Title : General Livestock Management**

**Total Theory Lectures: 14**

S. N.	Topic	Date	Day	
1	Demographic distribution of livestock & role in Indian economy; Problems & prospects of livestock industry in India	28 Oct	Monday	Dr. B. M. Khati
2	Animal holding & land holding patterns in different agro-climatic zones	11Nov	Monday	Dr. B. M. Khati
3	Introduction to Livestock Production systems including Organic livestock production	18Nov	Monday	Dr. B. M. Khati
4	Common animal husbandry terms related to cattle, buffalo	25Nov	Monday	Dr. B. M. Khati
5	Common animal husbandry terms related to sheep, goat, pig	02 Dec	Monday	Dr. B. M. Khati
6	Common animal husbandry terms related to horse, camel, yak & mithun	09 Dec	Monday	Dr. B. M. Khati
7	Body conformation & methods of identification in livestock	16 Dec	Monday	Dr. B. M. Khati
8	Transportation of livestock & wild/zoo animals	23 Dec	Monday	Dr. B. M. Khati
9	Common farm management practices including disinfection, isolation, quarantine & disposal of carcasses	30 Dec	Monday	Dr. B. M. Khati
10	Common farm management practices including disinfection, isolation, quarantine & disposal of carcasses	06 Jan	Monday	Dr. B. M. Khati
11	Introduction to the methods of drug administration.	12 Jan	Monday	Dr. B. M. Khati
12	Common vices of animals (cattle, buffalo, sheep & goat), their prevention and care	20 Jan	Monday	Dr. B. M. Khati
13	Preparation of animals for show, Judging & BCS for body parts of livestock	27 Jan	Monday	Dr. B. M. Khati
14	Culling of animals; Selection & purchase of livestock	03 feb	Monday	Dr. B. M. Khati

**PRACTICAL Unit – 1 Title : General Livestock Management Total Practicals: 12**

S. N.	Topic	Date	Time	
1	General introduction of the Institute animal farm	22-24Oct	14:00 – 16:00	Dr. B. M. Khati
2	Identification of common tools used on animal farm	22 -24Oct	16:00 – 18:00	Dr. B. M. Khati
3	Familiarization of body points of animals Cattle & Buffalo	25-28 Nov	14:00 – 16:00	Dr. B. M. Khati
4	Familiarization of body points of animals Sheep, Goat, Pig & Horse	25-28 Nov	16:00 – 18:00	Dr. B. M. Khati
5	Methods of Identification (marking, tattooing, branding, tagging & electronic chip)	23-26 Dec	14:00 – 16:00	Dr. B. M. Khati
6	Approaching and handling of animals. Use of rope for knot & halter making.	23-26 Dec	16:00 – 18:00	Dr. B. M. Khati
7	Dentition & ageing of animals Cattle & Buffalo	27-30 Jan	14:00 – 16:00	Dr. B. M. Khati
8	Dentition & ageing of animals Sheep, Goat, Pig & Horse	27-30 Jan	16:00 – 18:00	Dr. B. M. Khati
9	Preparation of animals for show, judging, fairs and melas	24-27 Feb	14:00 – 16:00	Dr. B. M. Khati
10	Selection and culling of animals	24-27 Feb	16:00 – 18:00	Dr. B. M. Khati
11	Preparation of project proposal Cattle & Buffalo	24-27 Mar	14:00 – 16:00	Dr. B. M. Khati
12	Preparation of project proposal Sheep & Goat	24-27 Mar	16:00 – 18:00	Dr. B. M. Khati

**Unit – 2****Title :Fodder Production & Conservation****Total Theory Lectures: 11**

S. N.	Topic	Date	Day	
1	Importance of grasslands and fodder in livestock production.	22 Oct	Tuesday	Dr. G. P. Shende
2	Agronomical Practices for fodder production- Environment, soil type, Land preparation, sowing time, sowing method, seed rate, manure/fertilizer, irrigation, weed control, harvesting time,method and yield.	29 Oct	Tuesday	Dr. G. P. Shende
3	Agronomical Practices for fodder production-cereal fodder-Kharif and summer season - Jowar,Bajra,MaizeRabi season -Teosinte and Oats	12 Nov	Tuesday	Dr. G. P. Shende

4	Agronomical Practices for fodder production of annual and perennial grass fodder- Hybrid Napier, Guinea grass, Para grass, Deenanath, Marvel grass, Rhodes grass, Sudan grass and Anjan grass	19 Nov	Tuesday	Dr. G. P. Shende
5	Agronomical Practices for fodder production -Legume crops Kharif and summer season -Cowpea, Rice bean Velvet bean, Guar and Soyabean	26 Nov	Tuesday	Dr. G. P. Shende
6	Agronomical Practices for fodder production-Legume crops Rabi season -Lucerne, Berseem, Metha and Senji	10 Dec	Tuesday	Dr. G. P. Shende
7	Soil and Water conservation and drainage of water for fodder production.	17 Dec	Tuesday	Dr. G. P. Shende
8	Fodder production for small livestock units (backyard cultivation, intercropping, fodder production on waste land/low lying area bunds, charies, canals, azolla& hydroponics)	24 Dec	Tuesday	Dr. G. P. Shende
9	Structures for storage of feeds and fodders.	31 Dec	Tuesday	Dr. G. P. Shende
10	Preservation of green fodder- Silage and Hay making Scarcity fodder trees- Acacia, Banyan, Peepal, Glyciridia, Mango, Neem, Tamarind, Bilayati, Subabool, Other sources- Failed crops, Crop residues, Plant oriented wastes, Agro-Industry wastes	07 Jan	Tuesday	Dr. G. P. Shende
11	Recycling of animal washings and wastes in fodders production and use of recycle waste.	21 Jan	Tuesday	Dr. G. P. Shende

## Unit – 2

### Title :Fodder Production & Conservation

Total Practicals: 6

S. N.	Topic	Date	Time	
1	Visit to the fodder farm. Familiarization with the various types of fodders in the state and India.	02-05 Dec	14:00 – 16:00	Dr. G. P. Shende
2	Familiarization with various fertilizers and manures	02-05 Dec	16:00 – 18:00	Dr. G. P. Shende
3	Collection, preservation and storage of feed and fodder	06-09 Jan	14:00 – 16:00	Dr. G. P. Shende
4	Damages or loss during transport and storage; methods to prevent them	06-09 Jan	16:00 – 18:00	Dr. G. P. Shende
5	Cost of calculations of fodder production.(One Cereal & one legume crop)-----	03-06 Feb	14:00 – 16:00	Dr. G. P. Shende
6	Livestock waste utilization and recycling.	03-06 Feb	16:00 – 18:00	Dr. G. P. Shende

## Unit – 3Title: Livestock Production Management-Ruminants

Total Theory Lectures: 17

Sr.	Topic	Date	Day	
1	Housing systems, layout and design of different buildings for animals	25 Oct	Friday	Dr.B. M. Khati
2	Selection of site. General principles affecting the design and construction of building for housing of cattle & buffalo.	22 Nov	Friday	Dr. B. M. Khati

3	Selection of site. General principles affecting the design and construction of building for housing of Sheep & Goat.	29 Nov	Friday	Dr. B. M. Khati
4	Building materials used for construction of wall, roof and floor of animal houses, their characteristics, merits and demerits. Utilization of local materials.	06 Dec	Friday	Dr. B. M. Khati
5	Arrangements of the building with special reference to Indian conditions.	13 Dec	Friday	Dr. B. M. Khati
6	Breeds of cattle and buffalo and descriptions of important breeds.	20 Dec	Friday	Dr. B. M. Khati
7	Economic traits of cattle and buffaloes.	27 Dec	Friday	Dr. B. M. Khati
8	General management and feeding practices of calves, heifers, pregnant and lactating animals.	03 Jan	Friday	Dr. B. M. Khati
9	General management and feeding practices of dry animals, bulls and working animals.	10 Jan	Friday	Dr. B. M. Khati
10	Draught ability of cattle and buffaloes.	17 Jan	Friday	Dr. B. M. Khati
11	Raising of buffalo males for meat production	24 Jan	Friday	Dr. B. M. Khati
12	Routine animal farm operations and labour management	31 Jan	Friday	Dr. B. M. Khati
13	Animal farm accounts and records.	07 Feb	Friday	Dr. B. M. Khati
14	Methods of milking and precautions. Factors affecting quality and quantity of milk production. Clean milk production	14 Feb	Friday	Dr. B. M. Khati
15	Breeds of sheep and goat and their descriptions. Important economic traits for meat, milk and fibre.	21 Feb	Friday	Dr. B. M. Khati
16	General management and feeding practices during different stages of growth, development and production (milk, meat and wool).	28 Feb	Friday	Dr. B. M. Khati
17	Breeding schedule and management of ram and buck. Weaning and fattening of lambs and kids	07 Mar	Friday	Dr. B. M. Khati

### Unit – 3 Title: Livestock Production Management-Ruminants

**Total Practicals: 11**

S. N.	Topic	Date	Time	

1	Layout plans for different livestock houses	18-21 Nov	14:00 – 16:00	Dr. B. M. Khati
2	Visit to different animal farms and Identification of various breeds of cattle, buffalo, sheep and Goat	18-21 Nov	16:00 – 18:00	Dr. B. M. Khati
3	Humane handling , restraining & casting of cattle, buffalo, sheep and Goat	16-19 Dec	14:00 – 16:00	Dr. B. M. Khati
4	Clipping, shearing, dipping, spraying and spotting sick animals.	16-19 Dec	16:00 – 18:00	Dr. B. M. Khati
5	Determination of body weight using different measurements.	20-23 Jan	14:00 – 16:00	Dr. B. M. Khati
6	Familiarization with routine cattle, buffalo, sheep and goat farm operations	20-23 Jan	16:00 – 18:00	Dr. B. M. Khati
7	Milking of dairy animals.	17-20 Feb	14:00 – 16:00	Dr. B. M. Khati
8	Training of breeding males	17-20 Feb	16:00 – 18:00	Dr. B. M. Khati
9	Detection of heat. Identification and care of pregnant animals, care of neonatal and young stock	17-20 Mar	14:00 – 16:00	Dr. B. M. Khati
10	Economics of dairy farm.	17-20 Mar	16:00 – 18:00	Dr. B. M. Khati
11	Economics of sheep or goat farm	14-17 Apr	14:00 – 16:00	Dr. B. M. Khati

#### **Unit – 4**

**Title: Zoo Animals Production Management**

**Total Theory Lectures: 12**

<b>S. N.</b>	<b>Topic</b>	<b>Date</b>		
1	Taxonomy of important wild zoo animals.	28 Jan	Tuesday	Dr. G. P. Shende
2	Taxonomy of important wild zoo animals.	04Feb	Tuesday	Dr. G. P. Shende
3	Status and conservation practices of wild life in India.	11 Feb	Tuesday	Dr. G. P. Shende
4	Basic principles of habitat and housing of various classes of wild zoo animals.	18 Feb	Tuesday	Dr. G. P. Shende
5	Size and space requirement (dimension) of cubicles, enclosures of important wild zoo animals.	25Feb	Tuesday	Dr. G. P. Shende
6	Management of livestock in fringe areas, in and surrounding the breeding areas.	04Mar	Tuesday	Dr. G. P. Shende
7	Feeding habits of captive animals.	11Mar	Tuesday	Dr. G. P. Shende
8	Feeds and feeding schedules of captive animals.	18Mar	Tuesday	Dr. G. P. Shende
9	Restraining, capture, handling, physical examination of captive animals.	25Mar	Tuesday	Dr. G. P. Shende

10	Classification of zoos, general management practices of sanctuaries, national parks etc.	01 Apr	Tuesday	Dr. G. P. Shende
11	Acts and Rules related to captive animals.	08 Apr	Tuesday	Dr. G. P. Shende
12	National and international organization and institutions interlinked to captive animals role and functioning.	15 Apr	Tuesday	Dr. G. P. Shende

#### **Unit – 4**

#### **Title :Zoo Animals Production Management**

#### **Total Practicals: 6**

<b>S. N.</b>	<b>Topic</b>	<b>Date</b>	<b>Time</b>	
1	Visit to nearby wildlife sanctuary/zoo, captive animals centres to study care and management of these animals.	03-06 Mar	14:00- 16:00	Dr. G. P. Shende
2	To study housing of captive animals.	03-06 Mar	16:00- 18:00	Dr. G. P. Shende
3	To study feeds and feeding schedule of captive animals.	31 Mar-03Apr	14:00- 16:00	Dr. G. P. Shende
4	Hygienic preparation, preservation and storage of feeds of captive animals.	31 Mar-03 Apr	16:00- 18:00	Dr. G. P. Shende
5	Familiarization about restraining, handling of captive animals.	05-08May	14:00- 16:00	Dr. G. P. Shende
6	Physical examination of captive animals.	05-08 May	16:00- 18:00	Dr. G. P. Shende

#### **Unit – 5**

#### **Title : Animal Welfare**

#### **Total Theory Lectures: 14**

<b>S. N.</b>	<b>Topic</b>	<b>Date</b>		
1	Definition of animal welfare and ethics. Human and animal welfare in relation to ecosystem and environmental factors.	22 Apr	Tuesday	Dr. G. P. Shende
2	Role of veterinarians in animal welfare.	29 Apr	Tuesday	Dr. G. P. Shende
3	List of Animal welfare organizations. Animal Welfare Board of India - their role, functions and current status.	06 May	Tuesday	Dr. G. P. Shende
4	Rules, regulations, laws on animal welfare. Prevention of Cruelty to Animals (PCA) Act, 1960 {59 of 1960}	13 May	Tuesday	Dr. G. P. Shende

5	Role and function of Committee for the Purpose of Controlling and Supervising Experiments in Animals (CPCSEA).	20 May	Tuesday	Dr. G. P. Shende
6	Protection of wild life in nature and captivity.	27 May	Tuesday	Dr. G. P. Shende
7	Protection and welfare of performing animals.	03 Jun	Tuesday	Dr. G. P. Shende
8	Welfare of animals during transportation.	10 Jun	Tuesday	Dr. G. P. Shende
9	Animal welfare in commercial livestock farming practices. Protection and welfare of working animals.	17 Jun	Tuesday	Dr. G. P. Shende
10	Pet and companion animal welfare.	24 Jun	Tuesday	Dr. G. P. Shende
11	Animal welfare during natural calamities and disaster management.	01 Jul	Tuesday	Dr. G. P. Shende
12	Legal duties of veterinarians, Common offences against animals and laws related to these offences.	08 Jul	Tuesday	Dr. G. P. Shende
13	Provincial and Central Acts relating to animals. Laws relating to offences affecting Public Health.	15 Jul	Tuesday	Dr. G. P. Shende
14	Livestock Importation Act Evidence, liability and insurance. Code of Conduct and Ethics for veterinarians - the Regulations made under the Act.	22 Jul	Tuesday	Dr. G. P. Shende

**Unit – 6 Title : Poultry Production Management Total Theory Lectures: 22**

Sr.	Topic	Date	
1	Indian poultry industry – Brief outline of the different segments – poultry statistics Classification of poultry with respect to production characters, age and standards		Friday
2	Production characters of other avian species		Friday
3	Description of indigenous fowls and their value in rural farming. Specific strains developed for rural poultry production; their acceptability and importance in rural eco-system		Friday
4	Housing –Types of poultry houses – space requirements. Recent advances in housing systems and rearing systems.		Friday
5	Scavenging system of management – Low input technology – Backyard and semi-intensive units; their management and economic achievements.		Friday
6	Deep litter management – control of litter-borne diseases and recycling of litter.		Friday
7	Brooding management – Types of brooders – preparation of shed – Importance of environmental factors		Friday
8	Cage management – Different types; Advantages and disadvantages.		Friday
9	Management of growers		Friday
10	Management of layers.		Friday
11	Management of broilers		Friday
12	Management of breeders.		Friday
13	Stress management, Water management		Friday
14	Feeding management–Classification of nutrients		Friday
15	Nutrient requirements and feed formulations.		Friday
16	Feeding systems–Feed restrictions – phase feeding – Additives and supplements.		Friday
17	Breeding systems and methods of mating. Breeding for specific characters and for hybrid chicken production.		Friday
18	Selection and culling. Poultry judging. Egg structure – Physical and chemical composition.		Friday
19	Common poultry diseases : Bacterial and viral diseases, Coccidiosis		Friday



20	Common poultry diseases : Metabolic and Deficiency diseases		Friday
21	Bio-security and principles of disease prevention management.		Friday
22	Health care for common poultry diseases – vaccination. General principles of poultry medication.		Friday

**Unit – 5 Title : Poultry Production Management Total Practicals: 11**

Sr.	Topic	Date	Time
1	Common breeds of poultry, different classes	11-14 Nov	14:00- 16:00
2	Indian chickens and other avian species breeds.	11-14 Nov	16:00- 18:00
3	Digestive and respiratory system of chicken., Male and female reproductive system–Egg structure, physical and chemical composition, Quality changes in egg during storage.	09-12 Dec	14:00- 16:00
4	Economic traits of broilers. Economic traits of egg-type chicken and breeders. AI in poultry.	09-12 Dec	16:00- 18:00
5	Housing and design of a poultry farm, Automization in poultry farms (EC house).	06-09 Jan	14:00- 16:00
6	Poultry farm equipment and their classification.	06-09 Jan	16:00- 18:00
7	Brooding arrangement in broiler farms.	10-13 Feb	14:00- 16:00
8	Poultry feed ingredients and its quality assessment. Poultry feed preparations.	10-13 Feb	16:00- 18:00
9	Calculation of different economic indices of broiler farm. Calculation of economic indices of layer farm.	10 -13 Mar	14:00- 16:00
10	Fundamentals in poultry Post-mortem examination for sample collection. Collection and dispatch of samples for PM examination.	10 -13 Mar	16:00- 18:00
11	Management during Summer, Winter and Rainy season.	07 -10 Apr	14:00-16:00

**Unit – 7**

**Title : Diversified Poultry Production And Hatchery Management**

**Total Theory Lectures: 12**

S. N.	Topic	Date	
1	Principles of incubation, Hatchery management practices		Friday

2	Factors affecting fertility and hatchability		Friday
3	Selection and care of hatching eggs and Hatchery hygiene, Candling, sexing, grading, packing and disposal of hatchery waste.		Friday
4	Economics of hatchery business – Troubleshooting hatchery failures–Computer applications in hatchery management.		Friday
5	Poultry waste management, Pollution and environmental issues.		Friday
6	Organic and hill farming.		Friday
7	Mixed or integrated poultry farming, Vertical & horizontal integration in commercial poultry production – Contract farming.		Friday
8	Export import of poultry produce and marketing.		Friday
9	Management of Ducks.		Friday
10	Management of Japanese quails.		Friday
11	Management of Turkeys.		Friday
12	Management of Geese and Guinea fowls.		Friday

#### **Unit – 6**

**Title :Incubation And Hatchery Management**

**Total Practicals: 06**

<b>S. N.</b>	<b>Topic</b>	<b>Date</b>	<b>Time</b>
1	Hatchery layout and design.	07 -10 Apr	14:00- 16:00
2	Project report for establishing a broiler farm.	12-15 May	16:00- 18:00
3	Project report for establishing a layer farm.	12-15 May	14:00- 16:00
4	Project report for establishing a breeder farm.	09 -12 Jun	16:00- 18:00
5	Visit to commercial poultry farms or hatchery or feed mill.	09 -12 Jun	14:00- 16:00
6	Visit to farms of other avian species.	07-10 Jul	16:00- 18:00

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**Unit – 8****Title :Laboratory Or Rabbit Or Pet Animal Production Management****Total Theory Lectures: 14**

Sr.	Topic	Date		
1	Importance of lab animals in research and selection of laboratory animals for research.	10 Feb	Monday	Dr. B. M. Khati
2	Care and housing standards of mice, rats, hamster, guinea pigs & rabbit.	17 Feb	Monday	Dr. B. M. Khati
3	General considerations on feeding and breeding of laboratory animals.	24 Feb	Monday	Dr. B. M. Khati
4	Concept of production of specific pathogen free and germ free laboratory animals.	03 Mar	Monday	Dr. B. M. Khati
5	Scope of rabbit farming in the country, breeds and their distributions in India. Limitation of rabbit animal production. Selection, care and management of breeding stock for commercial purpose.	10 Mar	Monday	Dr. B. M. Khati
6	Identification, care and management of kindling animals. Care of new born, growing stock.	17 Mar	Monday	Dr. B. M. Khati
7	Breeding and selection techniques for optimal production of rabbit.	24 Mar	Monday	Dr. B. M. Khati
8	Feeds and feeding for rabbit production.	06 Apr	Monday	Dr. B. M. Khati
9	Hygienic care and Housing for rabbit production. Disposal, utilization and recycling of waste etc.	21 Apr	Monday	Dr. B. M. Khati
10	Preparing projects for micro (Backyard), mini and major rabbit farms.	28 Apr	Monday	Dr. B. M. Khati
11	Important breeds of dogs, cats and pet birds.	05 May	Monday	Dr. B. M. Khati
12	Feeding of dogs, cats and pet birds.	19 May	Monday	Dr. B. M. Khati
13	Dog show: preparation for show, kennel clubs, important characteristics for judgment.	26 May	Monday	Dr. B. M. Khati
14	Utility of dogs- guarding, defense, patrolling, riot control, scouting, espionage, mine detection, tracking, guiding, hunting, races, retrieving rescue and other uses.	02 Jun	Monday	Dr. B. M. Khati

**Unit – 7****Title :Laboratory Or Rabbit Or Pet Animal Production Management****Total Practicals: 07**

Sr.	Topic	Date	Time	
1	Identification of body parts and handling, weighing, sexing and weaning of laboratory animals.	21-24 Apr	14:00- 16:00	Dr. B. M. Khati
2	Marking for identification of laboratory animals for purpose of their individual recording. Maintenance of breeding records of laboratory animals.	21-24 Apr	16:00- 18:00	Dr. B. M. Khati
3	Computation, feeding schedule of balanced diet for high breeding efficiency of laboratory animals. Prophylactic measures against common disease of laboratory animals. Hygienic care and control of parasites.	26-29 May	14:00- 16:00	Dr. B. M. Khati
4	Shearing of rabbit. Feeding and Housing requirement and equipments for rabbit. Projects report for establishing of rabbit farm.	26-29 May	16:00- 18:00	Dr. B. M. Khati

5	Handling and restraining of dog, cat and pet bird and equipments for pet animals and birds.	23-26 June	14:00- 16:00	Dr. B. M. Khati
6	Brushing or grooming and bathing of dogs and cats. Nail and tooth care, clipping of hairs for show purpose.	23-26 June	16:00- 18:00	Dr. B. M. Khati
7	Care of pups, kitten and weaning.	21-24 Jul	14:00-16:00	Dr. B. M. Khati

#### Unit – 9

#### Title :Swine Or Equine Or Camel, Yak And Mithun Production Management

#### Total Theory Lectures: 14

Sr.	Topic	Date		
1	Introduction and scope of swine farming in the country. Demography of swine population.	21 Mar	Friday	Dr. B. M. Khati
2	Selection and breeding techniques in swine. Important breeds (exotic and indigenous) & their characteristics.	28 Mar	Friday	Dr. B. M. Khati
3	Housing and feeding of swine.	04 Apr	Friday	Dr. B. M. Khati
4	Management of breeding and pregnant sows; sows at farrowing and after farrowing:	11 Apr	Friday	Dr. B. M. Khati
5	Management of pig-lets, growing stock, lactating sows, and feedlot stock.	25 Apr	Friday	Dr. B. M. Khati
6	Equine population of India. Horses, donkeys and mules and their utility. Identification of breeds of horses, colors and markings.	02 May	Friday	Dr. B. M. Khati
7	Dentition & ageing of horses .Care and routine management of equines including grooming, saddling and exercise.	09 May	Friday	Dr. B. M. Khati
8	Stable and its management. Vices of horses. Foot care and shoeing care of horses.	16 May	Friday	Dr. B. M. Khati
9	Feeding routine for horse, donkeys and mules. Care of stallion.	23 May	Friday	Dr. B. M. Khati
10	Mating of horses, brood mare and its care. Foaling and care of newborn.	30 May	Friday	Dr. B. M. Khati
11	Breeding mules. Care of race horses and preparing horses for show. Doping and its detection. Colic and its prevention.	06 Jun	Friday	Dr. B. M. Khati
12	Common breeds of camel in India and their utility, peculiarities in camel. Feeding schedule of camel, rutting symptoms in camel.	13 Jun	Friday	Dr. B. M. Khati
13	Vices of camel. Care of breeding in camel, pregnancy and parturition of camel.	20 Jun	Friday	Dr. B. M. Khati
14	Population statistics and utility, peculiarities of yak. Feeding and breeding of Mithun or Yaks. Yak × cattle crossing, hybrids from Mithun or Yaks and their adaptation to high altitude, milk composition of Mithun or Yaks.	27 Jun	Friday	Dr. B. M. Khati

#### Unit – 8

#### Title :Swine Or Equine Or Camel, Yak And Mithun Production Management

#### Total Practicals: 06

Sr.	Topic	Date	Time	
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1	Handling and restraining of swine, equine and camels.	19-22 May	14:00- 16:00	Dr. B. M. Khati
2	Identification of pregnant animals, care during pregnancy, isolation and care of farrowing sows and piglets.	19-22 May	16:00- 18:00	Dr. B. M. Khati
3	Preparation of swine and equine for show and judging.	16 -19 Jun	14:00- 16:00	Dr. B. M. Khati
4	Preparation of plans for sty and stables. Economics of pig farming.	16 -19 Jun	16:00- 18:00	Dr. B. M. Khati
5	Routine inspection of pig, tooth care and Vaccination schedule of pig	14-17 Jul	14:00- 16:00	Dr. B. M. Khati
6	Horse riding, walking, trotting cantering and galloping.	14-17 Jul	16:00- 18:00	Dr. B. M. Khati

Semester wise distribution of major courses for regular candidates of MAFSU admitted to M. V. Sc. degree course in the discipline of Livestock Production and Management (two year duration).

Semester	Course No.	Course Title	Credits
Semester I			
LPM 601*	Cattle and Buffalo Production Management		2+1
LPM 602*	Sheep and Goat Production Management		2+1
LPM 603*	Swine Production Management		1+1
Semester II			
LPM 604*	Climatology and Livestock Production		1+1
LPM 605*	Behaviour and Welfare of Farm Animals		1+1
LPM 606*	Equine Production Management		1+1
LPM 607*	Companion Animal Production Management		1+1
Semester III			
LPM 691	Seminar		1+0
LPM 699		Thesis Research	10
And Any 4 ( Four) Credits among following Courses			
LPM 608	Farm Hygiene and Waste Management		1+1
LPM 609	Integrated Livestock Farming Systems		1+1
LPM 610	Management and Conservation of Wild and Zoo Animals		1+1
LPM 611	Laboratory Animal Production Management		1+1
LPM 612	Livestock Business Management		1+1
LPM 613	Livestock Farm Machinery Management		0+2
LPM 614	Poultry Farm and Hatchery Management		1+1
LPM 615	Regional Animal Production Management		1+1
Semester IV			
LPM 699	Thesis Research		20

Semester wise distribution of course credits for M.V.Sc. (LPM)

Semester	Major	Minor	Supportive	Seminar	Thesis Research	Common	Total
I	8	4	4	-	-	5**	16
II	8	4	2	-	-		14
III	4	-	-	1	10		15
IV	-	-	-	-	20		20
Total	20	8	6	1	30	5	65

Course Title: Cattle and Buffalo Production Management

Course Code: LPM 601

Credit Hours: 2+1

#### Theory Schedule

Sr. No.	Title of the topic to be covered
1	Development of dairy industry in India and the world. Present status and future prospects of dairying in India and the world. SWOT analysis of the dairy sector in Maharashtra.
2	Production systems in vogue under Indian condition. Breeds of cattle and buffalo with more emphasis on breeds of economic importance.
3	Principles of housing/shelter management for cattle and buffaloes.
4	Housing and equipment requirements for different classes of cattle and buffaloes.
5	Layout plans and construction details for small farms in different climatic zones of India.
6	Layout plans and construction details for medium farms in different climatic zones of India.
7	Layout plans and construction details for large farms in different climatic zones of India.
8	Ventilation and lighting systems in dairy farms.
9	Feed resources used for feeding cattle and buffaloes.
10	Scientific technique and regimen of feeding of different categories of cattle and buffaloes.
11	Feed and fodder requirements of different categories of cattle and buffaloes. Supply of green fodder round the year.
12	Enrichment of poor quality roughages.
13	Fodder resources used for feeding cattle and buffaloes.
14	Scientific technique and regimen of watering of different categories of cattle and buffaloes.
15	Nonconventional feeding resources for lowering the feeding cost.
16	Pasture management.
17	Traits of economic importance and their inter-relationships in cattle and buffaloes.
18	Methods of selection and breeding.
19	Pre-natal and post-natal care and management of dams.

20	Care of neonates and young calves. Management strategies for reducing mortality in calves.
21	Optimizing age at first calving and calving interval.
22	Strategies of improving breeding efficiency of dairy animals.
23	Management of pregnant and lactating cow and buffalo.

24	Management of dry cow/buffalo and Management of bulls.
25	Routine management practices at farm and farm labour management.
26	Milking management and systems of milking.
27	Techniques of harvesting clean milk.
28	Cooling, chilling and transportation of milk.
29	Marketing of milk.
30	Different acts for governing the dairy sector to produce quality products at par international standards.
31	Health management of dairy animals. Summer and winter management of dairy animals.
32	Draughtability and management of draught animals.
33	Raising of buffalo males for meat production.
34	Draughtability in cattle & buffaloes, training care and general management.
35	Arrangements of the farm building with special reference to Indian conditions.
36	Importance of farm accounts and records. Different accounts and records maintained at farm.

Course Title: Cattle and Buffalo Production Management Course

Code: LPM 601

Credit Hours: 2+1

Practical Schedule

Sr. No.	Title of the topic to be covered
1	Visit to small dairy farms and assessment of routine management practices.
2	Visit to medium dairy farms and assessment of routine management practices.
3	Visit to large dairy farms and assessment of routine management practices.
4	Analysis of various livestock records for productivity evaluation.
5	Analysis of various financial records for economic evaluation.
6	Preparation of layout plan for medium dairy farm.
7	Preparation of layout plan for large dairy farm.
8	Computation of practical and economical rations.
9	Housing and management of cattle and buffalo.
10	Dairy Cattle and Buffalo judging.



11	BodyConditionScores (BCS).
12	Projectpreparationforsmalldairyfarms.
13	Projectpreparationformediumdairy farms.
14	Projectpreparationfor largedairy farms.
15	Methods of milking.
16	Training ofbreeding males.

CourseTitle:SheepandGoatProductionManagement Course Code:

LPM 602

CreditHours:2+1 Theory

Schedule

Sr. No.	Titleof thetopic to be covered
1	Populationstructureandimportanceofsmallruminants.
2	Sheepandgoatfarming underdifferentsystems of management.
3	Advantagesandlimitations ofsheep andgoat farming.
4	Geneticresourcesofsheepandgoatswithspecialempphasisonbreedsof economic importance.
5	Principlesofsheltermanagementfor smallruminants.
6	Housingandequipmentrequirementsfordifferentclassesofsheep.
7	Housingandequipmentrequirementsfordifferentclassesofgoats.
8	Designingoffeedersandwaterersforsmallruminants.
9	Layoutplansandconstructiondetailsforlargesizefarmsindifferentagro-climaticzonesofIndia.
10	Layout plans and construction details for backyard farms in different agro-climatic zones of India.
11	Feedresources forsmall ruminants.
12	Fodder resources for smallruminants.
13	Commonpropertyresources(CPR's)andtheir management.
14	Principlesandsystemsoffeedingdifferentcategoriesof sheep.
15	Principlesandsystems ofwateringdifferent categoriesof sheep.
16	Principlesandsystemsoffeedingdifferentcategoriesof goat.
17	Principlesandsystems of wateringdifferent categories of goat.
18	Pastureutilizationandimprovementforsmallruminants.
19	Traitsofeconomic importanceand their inter-relationship.
20	Breedingseasonsandbreedingmanagementinsmallruminants.
21	Selectionofbreedinganimalsinsmallruminants.
22	Methodsof detectionof heat, useof teaser,flushing and tugging.
23	Roleofestroussynchronizationinoptimizingreproductioninsmallruminants.
24	Naturalservice,artificialinseminationandoff-seasonbreedinginsmall ruminants.
25	Careandmanagement ofpregnantanimals.
26	Careandmanagement ofyoung ones.
27	Careandmanagementof breedingstockand culling.
28	Diseasemanagementinsmallruminants.

29	Prevention and control measures including vaccination and deworming.
30	Dipping and spraying in small ruminants.
31	Transportation of small ruminants.
32	Meat, methods of slaughter and dressing percentage.
33	Wool, shearing methods, importance of wool and wool quality.
34	Goat fibers, mohair, pashmina, marketing of goat fibers/ wool.

35	Goat milk, Milking, avoidance of goat yodour in milk, clean milk production and its therapeutic uses.
36	Rearing of small ruminants for special occasions, BCS, score card, preparation for show

C

Course Title: Sheep and Goat Production Management Course Code:

LPM 602

Credit Hours: 2+1

Practical Schedule

Sr. No.	Title of the topic to be covered
1	Visit to modern sheep farm and critical analysis of managerial practices.
2	Visit to traditional goat farms and critical analysis of managerial practices.
3	Visit to modern goat farms and critical analysis of managerial practices.
4	Study of practical housing management of goat.
5	Study of practical housing management of sheep.
6	Study of disease control management of sheep and goat.
7	Study of shearing management in sheep.
8	Identification of heat and study of mating systems.
9	Parturition and newborn management.
10	Record keeping and economics of sheep and goat farming for mutton/ chevon.
11	Record keeping and economics of sheep and goat farming for wool/ fibre.
12	Record keeping and economics of goat farming for milk.
13	Preparation of project report for commercial goat farm.
14	Preparation of project report for commercial sheep farm.
15	Daily farm operations on sheep and goat farm.
16	Periodical farm operations on sheep and goat farm.

Course Title: Swine Production Management Course

code: LPM 603

Credit Hours: 1+1 Theory

Schedule

Sr. No.	Title of the topic to be covered
1	Population dynamics: National and world. Contribution of pigs in Indian economy and advantages and disadvantages of swine husbandry. Systems of swine management.
2	Breeds of economic importance: Indian and exotic.

3	Various housing and rearing systems of pigs.
4	Housing (floor, roof, walls, drainage, door and gates etc.) and equipments requirement for different classes of swine. Layout plans and construction for different sized piggery farms.
5	General feeding principles and nutrient requirement of different classes (growing and finishing, breeding, pregnant, farrowing and orphan) of swine.
6	Feeding schedule for different classes of swine.

7	Methods of swine feeding: traditional and scientific.
8	Traits of economic importance in pigs and their interrelationship.
9	Selection of breeding stock. Various reproductive parameters of native, crossbred and exotic pigs.
10	Methods for detection of heat in pig. Different mating systems.
11	Care and management of different classes of swine: pregnant sows, piglets, growers, finishers.
12	Care and management of boar and Summer management in swine.
13	Economically important diseases, challenges and herd health management programme.
14	Health Management strategies to prevent disease.
15	Prevention and control measures including sanitation, vaccination, deworming, etc. and biosecurity measures to be adopted at swine farms.
16	Piglet anaemia and its management.
	Various methods of slaughter and dressing percentage.
17	Methods of marketing and transportation in pig
18	Utilization of by-products from the swine industry

Course Title: Swine Production Management Course

code: LPM 603

Credit Hours: 1+1

Practical Schedule

Sr. No.	Title of the topic to be covered
1	Visit to the modern piggery farm and critical analysis of various types of managerial practices.
2	Visit to the backyard piggery farm and critical analysis of various types of managerial practices.
3	Practical feeding management of various classes of pig. Requirement and supplying basic nutrients. Special consideration in each production phase. Combining different feed ingredients to meet nutrient needs of growing and finishing pigs.
4	Combining different feed ingredients to meet nutrient needs for breeding stock, pregnant, farrowing and lactating sow.
5	Breeding management of pig. Different breeding methods. Selection of breeding gilts and boar.
6	Different mating systems and measures to attain early puberty in pigs.

7	Best breeding practices to be followed. Heat detection and mating. Pregnancy and preparation for farrowing.
8	Disease control measures to be adopted on piggery farm including bio- security measures.
9	Steps in judging of different categories of swine.
10	Ranking and evaluation of different traits of different categories of swine using judging core card.
11	Importance of record keeping. Various records to be maintained at pig farm..
12	Advances in record keeping and evaluation of farm performance based on

	records
13	Formulation of economic rations for different classes of swine (growing and finishing).
14	Formulation of economic rations for different classes of swine: breeding stock, pregnant and farrowing sow and lactating sow.
15	Project report formulation for backyard pig farm.
16	Project report formulation for commercial pig farm.

Course Title: Climatology and Livestock Production Course Code:

LPM 604

Credit Hours: 1+1 Theory

Schedule

Sr. No.	Title of the topic to be covered
1	Climatology and agro-climatic regions of India.
2	Study of climatic factors and their measurements.
3	Effects of climatic stress in livestock (heat stress / cold stress), measurement and amelioration.
4	Temperature humidity index and thermo-neutral zone.
5	Adaptation and acclimatization of farm animals to different climatic conditions.
6	Light: natural and artificial. Mechanism of light action and responses.
7	Importance of photo-period and its effects on growth, production and reproduction in livestock.
8	Application of light in livestock production.
9	Performance of livestock introduced in different climates.
10	Micro-climate modification in animal houses-I
11	Micro-climate modification in animal houses-II
12	Livestock and global warming.
13	Climate-resilient livestock production systems.
14	Different types of natural disasters.
15	Effect of Natural disaster on livestock.
16	Natural disaster mitigation measures.
17	Estimation of microclimatic conditions in the Animal house- Measurement of Temperature, Relative humidity, Air Velocity and Mean temperature of the surroundings; measurement of the intensity of light in animal houses.

18	Environmentally controlled housing system for livestock.
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Course Title: Climatology and Livestock Production Course Code:  
LPM 604  
Credit Hours: 1+1  
Practical Schedule

Sr. No.	Title of the topic to be covered
1	Visit to modern weather forecast station – I.
2	Visit to modern weather forecast station – II.

3	Introduction of different instruments used for measurement of climatic factors.
4	Assessment of climate.
5	Microclimatic conditions within the animal house.
6	Measurement of macro-climatic conditions.
7	Measurement of temperature and relative humidity.
8	Estimation of Temperature Humidity Index.
9	Measurement of wind velocity.
10	Measurement of intensity of light.
11	Construction of climographs and hythergraphs.
12	Heat Tolerance Test in cattle.
13	Heat Tolerance Test in sheep and goats.
14	Heat tolerance test in buffalo.
15	Heat tolerance test in swine.
16	Heat Tolerance Test in Equines.

Course Title: Behaviour and Welfare of Farm Animals Course Code:  
LPM 605  
Credit Hours: 1+1 Theory  
Schedule

Sr. No.	Title of the topic to be covered
1	Introduction, evolution, theories and importance of animal behaviour studies.
2	Physiological basis of behaviour. Natural selection, proximate and ultimate causes, fitness, optimality theory, selfish genes, kin selection and game theory.
3	Genetic, environmental and physiological influence on animal behaviour.
4	Daily and seasonal cycles of behaviour. Patterns of behaviour.
5	Favorable and unfavorable behaviour of domestication.
6	Ethogram construction for general behaviour management and its interpretation.
7	Behaviour assisted animal management. Flight zone. Animal learning and training.
8	Conditioning: operant and classical. Animal behaviour based housing designs.
9	Methods of studying animal behaviour.
10	Causes and prevention of vices.

11	Group formation. Social relationships like hierarchy and aggression. The process of socialization. Locality and behaviour.
12	Behavioural characters for management practices.
13	Concepts of animal welfare, animal rights and animal freedoms.
14	Animal welfare organizations.
15	Measurement of animal welfare. Indicators of animal welfare improvement. Animal welfare through selection.
16	The welfare of livestock in commercial farms and captivity. Environmental enrichment.
17	Welfare of livestock during various management activities such as handling, transportation, etc.

18	Legislation and regulations of animal welfare. Welfare and economics.
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Course Title: Behaviour and Welfare of Farm Animals Course Code:

LPM 605

Credit Hours: 1+1

Practical Schedule

Sr. No.	Title of the topic to be covered
1	Assessment of behavioural characters in cattle and buffaloes for management practices.
2	Assessment of behavioural characters in sheep and goat for management practices.
3	Assessment of behavioural characters in horse and pig for management practices..
4	Study of behavioural adaptations in cattle and buffaloes under domestication.
5	Study of behavioural adaptations in horse and pig under domestication.
6	Study of behavioural adaptations in sheep and goat under domestication.
7	Analysis of behaviour of farm animals in relation to climate.
8	Analysis of social behaviour in cattle.
9	Analysis of social behaviour in goats.
10	Preparation of ethogram (time budgeting) at cattle farm.
11	Preparation of ethogram (time budgeting) at goat farm.
12	Preparation of ethogram (time budgeting) at pig farm.
13	Modifications in animal houses for farm animal welfare.
14	Assessment of animal welfare in terms of health.
15	Assessment of animal welfare in terms of feeding.
16	Assessment of animal welfare in terms of housing.

Course Title: Equine Production Management Course

Code: LPM 606

Credit Hours: 1+1 Theory

Schedule

Sr. No.	Title of the topic to be covered
1	Scope of equine husbandry in India.

2	Equine population dynamics.
3	Types and classes in equines and breeds of economic importance.
4	Housing and stable management.
5	Equine Behavior.
6	Stable vices and their management.
7	Care and management of stallion.
8	Care and management of broodmare/pregnant mare.
9	Care and management of mare approaching foaling and newborn foal.
10	Different stud farms, race clubs, race-horses and their care, training and exercising.
11	Different methods of doping and horsemanship.
12	Foot care and dental care in equines.

13	General equine health management and disease control.
14	Colic, equine azoturia: prevention and management.
15	Regulatory acts in equine disease control and welfare.
16	Equine Transportation.
17	Laws governing the import and export of equines.
18	Horse passport and trading.

Course Title: Equine Production Management Course

Code : LPM 606

Credit Hours: 1+1

Practical Schedule

Sr. No.	Title of the topic to be covered
1	Visit to different institutional stables.
2	Different identification methods in horses.
3	Ageing and dentition in horses.
4	Determination of soundness in horses.
5	Preparation of soundness certificate in horses.
6	Selection of horses for breeding purpose.
7	Selection of horses for race purpose.
8	Preparation of horses for transportation.
9	Passing of nasogastric tube (Stomach tube) in horses.
10	Types of shoeing and methods of application in horses.
11	Method of covering in horses.
12	Saddle and surcingle fittings in horses.
13	Saddle and surcingle fittings in horses
14	Different gaits in horses, Natural.
15	Different gaits in horses, ambling.
16	Colours and markings in horses.

Course Title: Companion Animal Production Management Course

Code : LPM 607

Credit Hours: 1+1 Theory

Schedule

Sr. No.	Title of the topic to be covered
1	Various companion animals, evolutionary history, the process of domestication of dog and cat.
2	Breeds of dogs and cats.
3	Ownership. Selection of dog, cat and other companion animals.
4	Dogs/cat body: structure, movement and special senses.
5	Reproduction and breeding management.
6	Care of newborn and weaner.
7	Reproductive problems of bitch and queen.
8	Socialization in dog and cat.

9	Principles of the feeding of dog and cat.
10	Feeding during different life stages and disease conditions.
11	Feeding behavior in dogs and cats.
12	Common nutritional problems and their preventive measures.
13	Basic Kennel and health management. Kennel clubs.
14	Principles of training of dogs and cats.
15	Dog shows. Preparation for the shows. Important characters for judgment.
16	Vaccination and deworming schedules for dogs and cats.
17	Utility of dogs- guarding, defense, patrolling, riot control, scouting, espionage, mine detection, tracking, guiding, hunting, races, retrieving rescue and other uses.
18	Importance of grooming, care at grooming and bathing of dogs and cat.

Course Title: Companion Animal Production Management Course

Code : LPM 607

Credit Hours: 1+1

Practical Schedule

Sr. No.	Title of the topic to be covered
1	Recognizing various breeds of dog.
2	Recognizing various breeds of cat.
3	Handling and restraining of dogs.
4	Handling and restraining of cats.
5	Routine management practices of dogs.
6	Routine management practices of cats.
7	Detection of oestrus, mating, whelping (through demonstration) in dogs.
8	Detection of oestrus, mating, kittening (through demonstration) in cats.
9	Kennel design and management.
10	Cattery design and management.
11	Hygiene of kennel and pens.
12	Licensing and identification of companion animals.
13	Visit to dog hostels and dog park.
14	Visit to dog shows.



15	Judging of dogs
16	Brushing or grooming and bathing of dogs and cats. Nail and tooth care, clipping of hairs for show purpose.

Course Title: Farm Hygiene and Waste Management Course Code :

LPM 608

Credit Hours: 1+1 Theory

Schedule

Sr. No.	Title of the topic to be covered
1	Sources of air pollutants in animal environment.
2	Measures to control air pollutants.
3	Factors affecting outdoor and indoor air pollution.

4	Methodstocontrol outdoor and indoor air pollution.
5	Sourcesof drinking waterin farm animals.
6	Impuritiesandinclusionsofdrinking water.
7	Hygienicrequirementsandstandardsfordrinkingwater.
8	Purificationofwater and water conservation.
9	Quantityofdungvoided by domesticanimals. Manure production.
10	Animal excreta asa factorin thespread of diseases.
11	Hygienicandeconomicdisposaloffarm wastes.
12	Valueaddition offarmwastes.
13	Drainageinlivestockfarms.Lagoons,Sewers,septictanks,drainsand traps.
14	Environmentalprotectionact: Air(Preventionand controlofpollution)act.
15	Environmentalprotectionact: Water(Preventionandcontrolofpollution) act.
16	Factorsaffectingenvironmentalpollution.
17	Effectofenvironmentalpollutiononlivestockandcontrolling measures
18	Effectofenvironmentalpollutiononlivestockproductsusedforhuman consumption and controlling measures

CourseTitle:FarmHygieneandWasteManagement Course Code :

LPM 608

CreditHours:1+1

PracticalSchedule

Sr. No.	Titleof thetopic to be covered
1	Assessmentofair pollutantsonanimal production.
	Assessmentofair pollutantsonanimal health
2	Collectionofwatersamplesfromdifferent sources.
3	Physicalexaminationofwater samples.
4	Chemical examinationofwatersamples.
5	Bacteriologicalandmicroscopicexaminationofwatersamples.
6	Biosecuritymeasuresatlivestockfarms.
7	Moderntechniquesusedinthe disposalof solidfarmwastes.
8	Moderntechniquesusedinthe disposalof liquidfarm wastes.
9	Study of odor control management.
10	Studyofmanure treatmentmanagement.
11	Valueaddedproducts fromfarmwastes–I.
12	Valueaddedproducts fromfarmwastes–II.
13	Visittowaterfiltrationplantsandstudyoffiltrationsystems(rapidandslow- sand, etc.).
14	Visittowaterfiltration plantsandstudyoffiltrationsystems(rapidand slow-sand, etc.).
15	Testingofdrainsinlivestock farms.
16	Testingofdrainsinlivestock farms.

CourseTitle:IntegratedLivestockFarmingSystems Course Code:

LPM 609

CreditHours:1+1 Theory

Schedule

Sr. No.	Title of the topic to be covered
1	Definition of integrated farming system. Classification of livestock-based farming systems. Scope and limitation of integrated farming systems.
2	Principles, drivers and trade-offs in integrated livestock farming systems.
3	Concept of sustainability in relation to ecological balance and eco-friendly environment.
4	Sustainability of integrated livestock farming systems and their economic importance.
5	Integration of arable farming + cattle and buffalo farm. Integration of arable farming + sheep and goat farm. Integration of arable farming + pig and poultry farm.
6	Integration of fish + pig farm. Integration of fish + poultry and duck farm. Integration of cattle + goat and fish + pig and FYM.
7	Integration of silk worm and bee keeping. Biogas production technology.
8	Vermicompost. Solar and wind energy utilization.
9	New approach for changing farming systems in the light of global warming.
10	New approach for changing farming systems in the light of carbon sequestration.
11	New approach for changing farming systems in the light of mitigation of GHGs (reducing carbon footprints).
12	New approach for changing farming systems in the light of mitigation of GHGs (reducing water footprints).
13	Project formulation and evaluation for agriculture + cattle and buffalo.
14	Project formulation and evaluation for agriculture + sheep and goat.
15	Project formulation and evaluation for fish + poultry + pig.
16	Project formulation and evaluation for fish + pig and fish + poultry.
17	Project formulation and evaluation for fish + agriculture and agriculture + poultry.
18	Project formulation and evaluation for agriculture + rabbit.

Course Title: Integrated Livestock Farming Systems Course Code:

LPM 609

Credit Hours: 1+1

Practical Schedule

Sr. No.	Title of the topic to be covered
1	Visit to modern integrated livestock farming units and critical analysis of different subunits.
2	Integration of fish and arable farming.
3	Integration of arable farming + cattle and buffalo farm.
4	Integration of arable farming + sheep and goat farm.

5	Integration of arable farming + pig and poultry farm.
6	Integration of fish + pig farm with its economic analysis.
7	Integration of fish + poultry and duck farm with its economic analysis.
8	Integration of cattle + goat and FYM with its economic analysis.
9	Integration of arable farming + bee keeping.
10	Integration of arable farming + silk worm.
11	Biogas production technology with its economic analysis.
12	Feasibility report preparation on agriculture + cattle and buffalo.
13	Feasibility report preparation on agriculture + sheep and goat.
14	Feasibility report preparation on agriculture + poultry.
15	Feasibility report preparation on agriculture + rabbit.
16	Feasibility report preparation on animal waste and feed factory.

Course Title: Management and Conservation of Wild and Zoo Animals Course Code: LPM

610

Credit Hours: 1+1 Theory

Schedule

Sr. No.	Title of the topic to be covered
1	Taxonomy and distribution of important Indian wild animals and birds.
2	Ecology of wildlife sanctuaries and national parks in India.
3	Biological and ecological basis of management of wildlife.
4	Principles and concepts of zoo and captive wild animals. Status of forest in India.
5	Rules and regulations of Zoo Authority of India. Wildlife protection act. Conservation of wild animals. Feeding of captive animals and birds.
6	Feeding of captive animals and birds.
7	Habitat Component's (Cover, food, water, space) development and conservation.
8	Wildlife health control.
9	Population dynamics (manipulation, movements, corridors, mortality) of herbivorous wild animals.
10	Population dynamics (manipulation, movements, corridors, mortality) of carnivorous wild animals.
11	Predator and prey relationship.
12	Human-animal conflict and refuge rehabilitation of herbivorous wild animals
13	Human-animal conflict and refuge rehabilitation of carnivorous wild animals.
14	Principles for the protection of wild and zoo animals.
15	Breeding seasons and breeding characteristics (puberty, pregnancy, parturition and postnatal survival of the young) of wild animals. Captive animal breeding.
16	Social factors among various species.
17	Wildlife census methods.
18	Miscellaneous management procedures with reference to wild life.

Course Title: Management and Conservation of Wild and Zoo Animals Course Code: LPM

610

Credit Hours: 1+1

Practical schedule

Sr. No.	Title of the topic to be covered
1	Visit to wildlife sanctuary/national park and study of flora and fauna.
2	Visit to biosphere reserves and study of flora and fauna.
3	Visit to conservation breeding center and study of flora and fauna.
4	Visit to nearby zoo and study of flora and fauna.
5	Feeding schedule of wild herbivorous animals in captivity.
6	Feeding of wild carnivorous animals in captivity.
7	Chemical restraining methods.
8	Physical restraining methods.
9	Funding agencies for wildlife research and preparation of project proposals - I
10	Funding agencies for wildlife research and preparation of project proposals - II
11	Funding agencies for wildlife research and preparation of project proposals - III
12	Habitat analysis and design for carnivores.
13	Habitat analysis and design for herbivores.
14	Habitat analysis and design for omnivores.
15	Habitat analysis and design for arboreal.
16	Habitat analysis and design for aquatic.

Course Title: Laboratory Animal Production Management Course

Code: LPM 611

Credit Hours: 1+1 Theory

Schedule

Sr. No.	Title of the topic to be covered
1	Importance of rabbit and guinea pigs as laboratory animals.
2	Importance of rats, mice and hamster as laboratory animals.
3	Systems of housing for laboratory animals. Systems of housing for rabbit and guinea pigs as laboratory animals.
4	Systems of housing for rats, mice and hamster as laboratory animals.
5	Layout and design for laboratory animal's house.
6	Feeding management for different laboratory animals. Feeding management for different laboratory animals (Rat, mice and hamster).
7	Feeding management for different laboratory animals (Rabbit and Guinea pig).
8	Feeding regimen and types of diets for laboratory animals.
9	Production of laboratory animal models for various experiments.
10	Management of specific pathogen free, gnotobiotic and germ-free animals.
11	Concepts related to the welfare of laboratory animals.
12	Biosecurity measures (Sanitary and hygienic measures).
13	Common diseases and their control measures.

14	Transportation in laboratory animals.
15	Breeding, growth, sexual maturity, mating and gestation in different laboratory animals.
16	Care and management during parturition and litter size gestation in different laboratory animals.
17	Weaning in laboratory animals.
18	Selection of breeding stock for replacement.

Course Title: Laboratory Animal Production Management Course

Code: LPM 611

Credit Hours: 1+1

Practical Schedule

Sr. No.	Title of the topic to be covered
1	Visit to laboratory animal house and critical analysis of various types of managerial practices I.
2	Visit to laboratory animal house and critical analysis of various types of managerial practices II.
3	Handling and restraining of rabbit and guinea pig.
4	Handling and restraining of rat, mice and hamster.
5	Study of housing requirement of laboratory animals. Study of housing requirement of laboratory animals (Rabbit and Guinea Pig)
6	Study of housing requirement of laboratory animals (rat, mice and hamster)
7	Study of practical breeding methods in rabbit and guinea pig.
8	Study of practical breeding methods in rat, mice and hamster.
9	Study of disease control in laboratory animals.
10	Study of special management for laboratory animals.
11	Study of ageing and sexing in laboratory animals. Study of ageing and sexing in laboratory animals (Rabbit and Guinea Pig).
12	Study of ageing and sexing in laboratory animals (rat, mice and hamster).
13	Study of identification in laboratory animals.
14	Study of economics of laboratory animal production I.
15	Study of economics of laboratory animal production II.
16	Study of nutrient requirements for laboratory animals.

Course Title: Livestock Business Management Course

Code: LPM 612

Credit Hours: 1+1 Theory

Schedule

Sr. No.	Title of the topic to be covered
1	Management principles.
2	Planning techniques, Strategic planning and organization structure for livestock business management.
3	Co-ordination and controlling techniques of management.

4	Different approaches to management.
5	Key economic concepts like factors of production, farm enterprises, cost of production, opportunity cost and value of production.
6	Analysis of gross margin, farm profit, net farm family income, substitution, and efficiency return to scarce resources.
7	Risk management in livestock species enterprises.
8	SWOT analysis of livestock enterprises.
9	Livestock production economics, theory of supply and demand, production relationships, production function, cost input variables and profit maximization.
10	Economics and the market.
11	Market intelligence, research and opinion polling.
12	Newer concepts in marketing.
13	Different ways of market surveillance.
14	Different marketing channels.
15	Marketing of livestock and livestock products.
16	Laws governing the marketing of livestock and livestock products.
17	Pricing strategies and supply chain management.
18	Different marketing agencies for livestock marketing.

Course Title: Livestock Business Management Course

Code: LPM 612

Credit Hours: 1+1

Practical Schedule

Sr. No.	Title of the topic to be covered
1	Study of different types of accounting records.
2	Fund flow statements.
3	Cost and benefit analysis.
4	Study of budgeting and control in livestock enterprises.
5	Preparation of financial statements.
6	Depreciation methods.
7	Accounting methods.
8	Trend and variance analysis.
9	Cost-volume-profit analysis.
10	Financial planning and forecasting.
11	Estimation of working capital requirement.
12	Break even analysis.
13	Visit to livestock business firms.
14	Visit to livestock business banks.
15	Preparing projects for financing livestock enterprises.
16	Preparing projects for financing livestock enterprises.

Course Title: Livestock Farm Machinery Management Course Code:

LPM 613

Credit Hours: 0+2

Practical Schedule

Sr. No.	Title of the topic to be covered
1	Visit to Instructional Livestock Farm Complex and identification of various livestock farm machineries.
2	Familiarization with different types of tractors used for agricultural/Fodder land operations
3	Familiarization with different parts and functions of tractor (for tillage implements and fodder land development)
4	Different parts and functions of power tiller for agriculture/fodder production operations
5	Familiarization of power tiller-drawn agriculture land tillage implements
6	Familiarization with different electric motors and diesel engines used for irrigation of fodder field.
7	Use of sprinkler for irrigation of fodder field. Drip irrigation technology for fodder production
8	Application of solar energy and wind energy for livestock farm management.
9	Common terms used in harvesting of fodder crops.
10	Introduction of the post-harvest equipment/ machineries.
11	Hay and forage harvesting equipments, mowers and field choppers
12	Use of chaff cutters for silage making.
13	Familiarization with different types of silos.
14	Familiarization with forage harvesters.
15	Familiarization with mechanical hay driers.
16	Familiarization with conventional balers, haystackers and straw combine.
17	Familiarization with different parts of milking machine.
18	Milking machine operation and handling, cleaning, and maintenance of the milking machine
19	Familiarization with shearing machines, handling, operation and cleaning of shearing machine after use
20	Familiarization with instruments used for milk packaging
21	Familiarization with automatic feeders
22	Atomization of feeding and watering operations, facilities for dairy farms
23	Atomization of feeding and watering operations, facilities for sheep and goat units
24	Atomization of feeding and watering operations, facilities for pig and poultry units
25	Familiarization with milk storing equipment and transportation of milk
26	Familiarization with milk pasteurization equipment and transportation of milk
27	Handling of equipment used for preparation of traditional milk products
28	Introduction to the Forage densifying machine/Feed block machine and its use-preparation of complete feed block (CFB)



29	Visit to feed mill to study use and maintenance of feed grinder and mixture machines in the farms
30	Visit to milk processing plant and familiarization of the milk storage, packaging, and transport machinery and equipments
31	Familiarization with cooling systems used in Livestock farms (Foggers, Misters, Showers, Sprinklers, Fans, Cooling pads etc.)
32	Introduction to the hoof-trimming machines for cattle, buffalo, sheep, and goats

Course Title : Poultry Farm and Hatchery Management Course

Code: LPM 614

Credit Hours: 1+1 Theory

Schedule

Sr. No.	Title of the topic to be covered
1	Poultry housing systems, cage vs floor system.
2	Litter management. Lighting for poultry.
3	Rearing of turkey, duck and quails.
4	Backyard poultry farming.
5	Management of chicks, growing.
6	Management of laying and breeding flocks.
7	Broiler production.
8	Selection and culling of laying flocks
9	Health management and management of birds during disease outbreaks.
10	Procuring, pre-incubation and storage of hatching eggs and methods of incubation.
11	Sanitation, disinfection and management of hatchery.
12	Biosecurity in poultry farms.
13	Embryonic development and factors affecting fertility of eggs.
14	Factors affecting hatchability of eggs.
15	Chick sexing, packing and hatchery business.
16	Transport management of eggs and poultry birds.
17	Waste management on the poultry farm.
18	Food safety concerns and regulations for meat & egg producers.

Course Title : Poultry Farm and Hatchery Management Course

Code: LPM 614

Credit Hours: 1+1

Practical Schedule

Sr. No.	Title of the topic to be covered
1	Visit to poultry farm and observation and recording of poultry farm management (Broiler unit).
2	Visit to poultry farm and observation and recording of poultry farm management (layer unit).
3	Study of brooding of chicks.
4	Study of selection of laying flocks.

5	Study of disease preventive measures on the poultry farm
6	Study of selection and care of hatching eggs.
7	Study of incubator operation on the hatchery.
8	Study of fumigation and sanitization of hatchery.
9	Study of candling setting and hatching of eggs.
10	Study of packaging and transportation of chicks.
11	Study of waste management inside the poultry farm.
12	Study of waste management outside the poultry farm.
13	Study of marketing of poultry products.
14	Study of feeding different age groups of birds.
15	Study of housing for poultry birds.
16	Study on general care and management in backyard poultry.

Course Title: Donkey Production Management Course

Code: LPM 615

Credit Hours: 1+1 Theory

Schedule

Sr. No.	Title of the topic to be covered
1	Advantages and constraints of donkey rearing in Maharashtra.
2	Donkey population and its demographic distribution in Maharashtra.
3	Types of donkeys found in Maharashtra.
4	Economic importance of donkeys in rural societies of Maharashtra.
5	Housing management for donkeys, cost effective housing in rural areas.
6	Traditional donkey rearing practices in Maharashtra.
7	Feeding management and nutritional requirements of donkeys.
8	Breeding management in donkeys.
9	Scientific method of donkey rearing.
10	Care and management of jack, brood jenny and foal.
11	Transportation of donkeys.
12	Vices in donkeys and their correction.
13	Care of hoof and shoeing in donkeys.
14	Health management practices and disease control.
15	Welfare of working donkeys.
16	Handling and restraining of donkeys.
17	Use of donkey for DAP, dairy and hide production.
18	Composition of donkey milk and its use.

Course Title: Donkey Production Management Course

Code: LPM 615

Credit Hours: 1+1

Practical Schedule

Sr. No.	Title of the topic to be covered
1	Visit to nearby donkey farm/sanctuary/melas

2	Study of handling and restraining of donkeys
3	Study of identification methods in donkeys
4	Study of ageing and dentition in donkeys
5	Housing and shelter management in donkeys
6	Study of transportation of donkeys.
7	Selection of donkeys for breeding purpose
7	Study of hoof disorders, care and shoeing in donkeys.
8	Care and management of donkeys during pregnancy and lactation
9	Care and management of newborn after parturition
10	Hoof disorders, care and shoeing in donkeys
11	Study of body condition scoring in donkeys
12	Study of Body measurements in donkeys.
13	Welfare assessment in donkeys in relation to feeding, housing and health
14	Study of economics of rearing donkeys in Maharashtra
15	Study of Health management, vaccination schedule and deworming practice for donkeys.
16	Study of donkey's milk composition and analysis.

Lecture Schedule for the Courses of Ph.D. in Livestock Production and Management

Course Title: Recent Developments in Large Ruminants Production Management Course Code:

LPM 701

Credit Hours: 2+1 Theory  
schedule

Sr. No.	Title of the topic to be covered
1	Present status of dairying in India vis-à-vis global and South Asian scenarios.
2	Production dynamics, recent policy initiatives in dairy development. Conservation of indigenous germplasm.
3	Advances in housing management, viz., design and layout.
4	Construction materials, cost of construction suits to various agro-climatic zones of India.
5	Low-cost housing for larger ruminants.
6	Ideal shelter management practices for better productivity.
7	Advances in manure and waste disposal
8	Recent approaches in breeding and reproductive management of dairy animals.
9	Optimization of reproductive traits.
10	Recent advances in estrus synchronization.
11	Recent advances in MOET.
12	Modern approaches towards using sexed semen.
13	Recent approaches in cloning and IVF for optimization of production potential.
14	Recent approaches in feeding of dairy bovines.
15	Recent management in phased feeding and transition period.
16	Different standards for drinking water and water hygiene.

17	Recent advances in eco-feeding. Hydroponic technology.
18	Advances in health management in dairy animals.
19	Preventive measures for production-related diseases in dairy animals.
20	Bio-security measures on farm.
21	Recent approaches towards reducing calf mortality.
22	Milking management.
23	Atomization in milking management.
24	Sanitary standards for the production of quality milk.
25	Phytosanitary standards for the production of quality milk
26	Post-harvest processing of milk.
27	Establishment of small dairy enterprises.
28	Establishment of medium dairy enterprises
29	Establishment of large dairy enterprises
30	SWOT analysis of dairy enterprises for various economic strata with different sizes
31	Computerization for dairy enterprise. Best management practices.
32	Advances in herd management and data analysis
33	Advances in the management aspects of buffaloes
34	Salvaging of buffalo calves.
35	Advances in work animal management.
36	Precision dairy farming.

Course Title: Recent Developments in Large Ruminants Production Management Course Code: LPM 701  
Credit Hours: 2+1  
Practical Schedule

Sr. No.	Title of the topic to be covered
1	Critical analysis of various types of managerial practices at cattle dairy farm.
2	Critical analysis of various types of managerial practices at buffalo dairy farm.
3	Preparation of layout and designs for construction of sheds of various sizes in Konkan region of Maharashtra.
4	Preparation of layout and designs for construction of sheds of various sizes in Western region of Maharashtra.
5	Preparation of layout and designs for construction of sheds of various sizes in Marathwada region of Maharashtra.
6	Preparation of layout and designs for construction of sheds of various sizes in Vidharbha region of Maharashtra.
7	Cost analysis of dairy bovine housing.
8	Cost analysis of dairy bovine housing
9	Organization of milking machines.
10	Dairy Cattle and Buffalo judging.
11	Dairy Cattle and Buffalo judging
12	Study of BCS of cattle and buffaloes.
13	Farm record analysis.

14	Project report preparation for small dairy farm.
15	Project report preparation for medium dairy farm.
16	Project report preparation for large dairy farm.

Course Title : Recent Developments in Small Ruminants Production Management Course  
Code: LPM 702  
Credit Hours: 2+1 Theory  
schedule

Sr. No.	Title of the topic to be covered
1	Relevance of small ruminants in the Indian economy.
2	Population and production dynamics of small ruminants.
3	Systems of rearing of small ruminants.
4	Needs and possibilities for research in future in small ruminants.
5	Recent approaches in breeding management in small ruminants.
6	Reproductive management of small ruminants.
7	Management during the breeding season/mating seasons.
8	Control of breeding season in small ruminants.
9	Recent approaches in reproductive biotechnologies in small ruminants.
10	MOET in small ruminants.
11	Cloning and transgenics in small ruminants.
12	Small ruminants genomics.
13	Accelerated lambing.
14	Recent approaches in feeding management in small ruminants.
15	Pasture management for small ruminants.
16	Grazing management for small ruminants.
17	Phase feeding in small ruminants.
18	Feed resources for small ruminants.
19	Feeding techniques under different systems in small ruminants.
20-25	Recent approaches in housing systems with reference to different agro-climatic zones and rearing systems wrt. a) Western and eastern Himalayan region b) Lower, middle, upper and transgangetic plains c) Eastern, central, western and southern plateau and hill region d) East and west plains and hill region e) Gujarat and western plains and hill region f) Islands region
26	Prospects of small ruminant management under stall-fed conditions.
27	Management of small ruminants during scarcity periods.
28	Migratory pattern and flock management.
29	Recent approaches in exploiting goat's, milk quality and safety.
30	Production aspects of dairy goats.
31	Wool production and its quality.
32	fiber production and its quality
33	Recent approaches in healthcare management,
34	Parasitic control in present ecological and environmental changes.
35	Organic production and forage management and conservation

36	Marketing management
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Course Title :Recent Developments in Small Ruminants Production Management Course

Code: LPM 702

Credit Hours: 2+1

Practical Schedule

Sr. No.	Title of the topic to be covered
1	Visit and Critical analysis of various farm practices in small ruminants.
2	Visit and Critical analysis of various farm practices in small ruminants.
3	Preparation of layout and designs for construction of sheds of large size farms in different agro-climatic zones of India.
4	Preparation of layout and designs for construction of sheds of backyard rearing in different agro-climatic zones of India.
5	Cost analysis of housing in small ruminants (large size).
6	Cost analysis of housing in small ruminants (small size).
7	Organization of shearing in sheep.
8	Sheep and goat judging techniques.
9	Study of BCS in small ruminants.
10	Study of farm record analysis at small ruminants farms.
11	Disease control management in small ruminants.
12	Structuring of score card and grading of wool.
13	Project report preparation for large commercial sheep units.
14	Project report preparation for small commercial sheep units.
15	Project report preparation for large commercial goat units.
16	Project report preparation for small commercial goat units.

Course Title: Recent Developments in Swine Production Management Course Code: LPM

703

Course Credit: 1+1 Theory

Schedule

Sr. No.	Title of the topic to be covered
1	Trends in pig population and pork production in India and world.
2	Different pig production systems followed in developed countries.
3	Recent approaches/strategies in improvement of economic traits of swine.
4	Prenatal and postnatal development of piglet. Care and management of newborn piglet.
5	Growth: Types of growth, factors affecting growth rate in pigs.
6	Breeding and reproduction management: Systems of breeding, fundamental rules of breeding. Puberty and factors affecting age at puberty.
7	Breeding and reproduction management: sexual behavior of sow and boar, oestrous cycle and detection of oestrous.
8	Pregnancy, reproductive efficiency. Analysis of different mating systems in swine.
9	Care and management of sow before, at and after farrowing and during lactation period.

10	Strategic management measures in feeding, phase feeding, split sex feeding and individual feeding of various classes of swine.
11	Strategic management measures in feeding, Phase feeding, Split sex feeding and individual feeding of various classes of swine
12	Recent advances in automatic feeding and watering techniques on piggery.
13	Different feed resources available, their nutritive value
14	feeding systems/methods.
15	Recent approaches/developments in housing. Environmental physiology and summer management of pig.
16	Recent approaches in manure management.
17	Occurrence/incidence of common diseases and strategies to reduce mortality in different classes and of pigs.
18	Important diseases of pigs. Herd health management. Biosecurity measures to be adopted at piggery.

Course Title: Recent Developments in Swine Production Management Course Code: LPM

703

Credit Hours: 1+1

Practical Schedule

Sr. No.	Title of the topic to be covered
1	Visit and critical analysis of various types of managerial practices at small scale farms.
2	Visit and critical analysis of various types of managerial practices at large scale farms.
3	Preparation of layout and designs for construction of sties for the backyard piggeries.
4	Preparation of layout and designs for construction of sties for the commercial piggeries.
5	Judging of various classes of pigs.
6	Assessment of Body Condition Score in swine.
7	Use of BCS to adjust feed intake.
8	Records and registers to be maintained at piggery farm (production)
9	Records and registers to be maintained at piggery farm (financial)
10	Recent tools used for analysis of farm records.
11	Preparation of Project report for commercial piggery.
12	Preparation of Project report for backyard piggery.
13	Transportation of Pigs
14	Study of marketing channels
15	Study of various marketing strategy
16	Study of import and export of piggery products

Course Title: Livestock and Environment Course Code:

LPM 704

Credit Hours: 1+0 Theory

Schedule

Sr. No.	Title of the topic to be covered
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1.	Effect of livestock on the environment: Role of ruminants in global warming,.
2.	Impact of slaughterhouse waste, tannery waste, stray and fallen animal on environment
3.	Strategies for mitigation of methane emission from the livestock sector.
4.	Animal waste management.
5.	A life cycle assessment of the environmental impacts of livestock in different production systems.
6.	Effect of environment on livestock and quality of products.
7.	Effect of heat and cold stress on livestock production.
8.	Effect of heavy metals and pesticide residues pollution on livestock and quality of products.
9.	Management of micro environment with respect to the animal well being.
10.	Management of macro-environment with respect to the animal well being

  

11.	Concept of Water footprints in farm animals and products.
12.	Concept of carbon footprints and carbon sequestration of farm animals and products.
13.	Thermal load indices and comfort zones for livestock.
14.	Carbon trading. Mechanisms and opportunities in the livestock sector.
15.	Selection of breeds of livestock for hot climate.
16.	Recent advances in shelter management practices under the impending climate change scenario.
17.	Effect of climate on reproduction of animals.
18.	Relation between environment and diseases in farm animals.

Course Title: Organic Livestock Production Course

Code: LPM 705

Credit Hours: 1+0 Theory

Schedule

Sr. No.	Title of the topic to be covered
1	Historical background and origin, organic livestock farming vis-a-vis conventional livestock farming.
2	Current status of organic farming in India and world.
3	Objectives and importance of organic livestock farming. Opportunities and problems of organic livestock farming in India.
4	Key consideration and selection of animals for organic production.
5	Housing management of livestock for organic production.
6	Feeding management for organic livestock production.
7	Breeding management for organic livestock production.
8	Health care management for organic livestock production.
9	Record keeping, processing and labeling and marketing of organic products.
10	Conversion of livestock farm into an organic farm. ITKs used in organic livestock production.
11	Organic farming standards in India and the world.
12	IFOAM basic standards.
13	WHO/FAO Codex Alimentarius, NSOP of India.



14	Role of organic livestock farming in environmental protection and biodiversity advancement.
15	Accreditation of inspection and certification agencies.
16	Organic certification mark. Guidelines for organic certification of livestock modalities in the certification of organic products.
17	The economic value of organic livestock products,
18	Pricing strategy and marketing of organic products.

Course Title: Recent Developments in Welfare of Farm Animals Course Code: LPM

706

Credit Hours: 1+0 Theory

Schedule

Sr. No.	Title of the topic to be covered
1	Ethology: Definition, its scope & importance in animal welfare. Animal Behaviour and its relation with physical and mental health of animal. Adaptation of different animals to changing environmental conditions. Species-specific behaviour changing with the season.
2	Different physiological conditions of animals as a guide to assess animal welfare. Not driving animals beyond their natural capacity, for better performance
3	Scientific strategies to avoid unnecessary injury, pain and stress to animals in animal houses by amelioration of climatic stress.
4	Scientific strategies to avoid unnecessary stress in animals during handling.
5	Scientific strategies to avoid unnecessary stress in animals during slaughter.
6	Scientific strategies to avoid unnecessary stress in animals during milking, shearing and transportation.
7	Scientific strategies to avoid unnecessary stress in bullocks during carting.
8	Scientific strategies to avoid unnecessary stress in animals during feeding.
9	Healthcare, providing safety, feeding and watering and let off to free roam to the unproductive, orphaned, injured animals and birds.
10	Good management of Goshalas
11	Safe shelters for unproductive, orphaned, injured animals and birds.
12	Conversion of their wastes into VAP to meet part cost of running shelters.
13	Education of the general public, especially children to avoid cruel harm to animals via lectures in schools, TV and radio talks, leaflets, etc.
14	Importance of animal welfare measures in well-being of animals.
15	Evaluation of animal welfare measures as an 'instrument' of good animal husbandry.
16	Evaluation of animal welfare measures as an 'instrument' of production of quality products.
17	Evaluation of animal welfare measures as an 'instrument' of enhanced income to farmers.
18	Animal welfare risks in different types of animal husbandry and Importance of Animal Ethics value in veterinary science & A.H.

Course Title: Entrepreneurship in Livestock Production Course Code:

LPM 707

Credit Hours: 1+1 Theory

schedule

Sr. No.	Title of the topic to be covered
1	Understanding livestock entrepreneurship, concept and characteristics of entrepreneurship.

2	Role of entrepreneur in relation to enterprise and functions of the entrepreneur in the economy.
3	Process of entrepreneurship development.
4	Barriers in entrepreneurship development.
5	The institutional interface in the development of entrepreneurship, incubation centers, startups.
6	PPP prospective in the animal husbandry sector.
7	Essential criteria for the development of entrepreneurship in livestock sectors.
8	Techno economic feasibility of livestock enterprises under different conditions.
9	Importance of training and development of management skills in livestock enterprises.
10	Business acumen.
11	Business communication.
12	Interpersonal skills for establishing an entrepreneurship.
13	Entrepreneurial training/development programs at the state and national level.
14	Livestock Insurance.
15	Bank and government support for entrepreneurship/financial credit and financial management.
16	General principles and practices/analyzing project appraisals and reports/ capital expenditure decisions/ reinvestment and payback.
17	Preparing projects for bank appraisal/ banking requirements.
18	Procurement management quality issues/standardization/grading and packaging.

Course Title: Entrepreneurship in Livestock Production Course Code:

LPM 707

Credit Hours: 1+1

Practical Schedule

Sr. No.	Title of the topic to be covered
1.	Visit to business incubation centre.
2.	Extrapolation of existing financial models in livestock entrepreneurship.
3.	Approach to the preparation of entrepreneurial project on livestock.
4.	Preparation of bankable project for small sized dairy enterprise.
5.	Preparation of bankable project for large sized dairy enterprise.
6.	Preparation of bankable project for small sized goat enterprise.
7.	Preparation of bankable project for small sized sheep enterprise
8.	Preparation of bankable project for large sized sheep farms.
9.	Preparation of bankable project for large sized goat farms.
10.	Preparation of bankable project for ram/lamb/male goat production.
11.	Preparation of bankable project for small sized pig production enterprise.
12.	Preparation of bankable project for large sized pig production enterprise.
13.	Preparation of bankable project for small and medium sized broiler/poultry enterprise.

14.	Preparation of bankable project for large sized broiler poultry enterprise.
15.	Preparation of bankable project for small sized layer poultry enterprise.
16.	Preparation of bankable project large sized layer poultry enterprise

Course Title:- Precision Livestock Farming Course No.:-

LPM 708

Credit Hours: 1+1 Theory

Schedule

Sr. No.	Title of the topic to be covered
1	Concept of precision livestock farming, Its Scope and limitations.
2	Utilities of precision tools in livestock farming in India
3	Present level of usage of precision tools in India.
4	Implementation of sensor systems and ICTs in animal health.
5	Implementation of sensor systems and ICTs in animal productivity and welfare.
6	Animal identification and tracking and radio frequency identification (RFID)
7	Livestock identification and trace back System (LITS) and real-time locating systems (RTLS).
8	Application of geo-tagging and virtual fencing in animal productivity.
9	Use of GPS and GIS in exploration of feeding resources.
10	Use of GPS and GIS in exploration of grasslands
11	Automation in water resource management at livestock farm I. Concept of constant level water bowl
12	Automation in water resource management at livestock farm II. Concept of water bowl with stop valve in animal sheds
13	Development of early warning system and decision support systems for animal health.
14	Evaluation of early warning system and decision support systems for animal health.
15	Development of early warning system and decision support systems for animal welfare.
16	Evaluation of early warning and decision support systems for animal welfare.
17	Application of different software's for database creation of livestock farms.
18	Computation and analysis of the data.

Course Title: Precision Livestock Farming Course No.:

LPM 708

Credit Hours: 1+1

Practical Schedule

Sr. No.	Title of the topic to be covered
1	GPS/GIS application in the exploration of breeding tracts of cattle breeds of India.
2	GPS/GIS application in the exploration of breeding tracts of buffalo breeds of India.

3	GPS/GIS application in the exploration of breeding tracts of sheep breeds of India.
4	GPS/GIS application in the exploration of breeding tracts of goat breeds of India
5	GPS/GIS application in the exploration of breeding tracts of pig breeds of India.
6	GPS/GIS application in the exploration of forage.
7	GPS/GIS application in the exploration of grassland profiles.
8	Visit to precision livestock farms (Dairy Cattle Farm) having automation and its critical analysis.
9	Visit to precision livestock farms (Buffalo Farm) having automation and its critical analysis.
10	Visit to precision livestock farms (Sheep Farm) having automation and its critical analysis.
11	Visit to precision livestock farms (Goat Farm) having automation and its critical analysis
12	Visit to precision livestock farms (Piggery Farm) and its critical analysis.
13	Use of various advanced tools in reproductive management of livestock (Ruminants)
14	Use of various advanced tools in reproductive management of livestock (non-ruminants)
15	Application of various advanced tools in healthcare of livestock.
16	Use of different softwares in farm routine operation.

Course Title: Recent Developments in Poultry Production Management Course Code: LPM 709

Credit Hours: 2+1 Theory

Schedule

Sr. No.	Title of the topic to be covered
1	Planning, organization, executive and management of small scale broiler production.
2	Planning, organization, executive and management of large scale broiler production.
3	Planning, organization, executive and management of small scale layer production.
4	Planning, organization, executive and management of large scale layer production.
5	Planning, organization, executive and management of hatcheries (small scale production).
6	Planning, organization, executive and management of hatcheries (large scale production).
7	Planning, organization, executive and management of quail An alternative in poultry production
8	Planning, organization, executive and management of duck An alternative in poultry production

9	Planning, organization, executive and management of turkeyAn alternative in poultry production
10	Planning,organization,executiveandmanagementofguineafowl An alternative in poultry production
11	Demandand supplyofalternativein poultry production.
12	Demandandsupply ofbroilermeat productionin India.
13	Demandandsupply ofegg productionin India.
14	Presentstatusof broilerproductionin India.
15	Presentstatusof layerproductionin India.
16	Problems and new management techniques in poultry for egg production in India.
17	Problemsandnewmanagementtechniquesinpoultryformeatinproductionin India.
18	ProblemsandnewmanagementtechniquesinhatcheriesinIndia.
19	Problemsandnewmanagementtechniquesinalternativepoultryproduction
20	Recentadvancemanagementtechniquesinpoultryforeggproductionin other countries.
21	Recent advanced management techniques in poultry for meat production in other countries.
22	Automationinbroilerhouses.
23	Automationinlayer houses.
24	Advancesinmanagement ofspecificpathogen-freebroiler flock.
25	Advancesinmanagement ofspecificpathogen-free layer flock.
26	Advancesinmanagementofspecificpathogen-freebroilerbreeder flock.
27	Broilerdevelopmentpoliciesandplanningforhigherproductionin India.
28	LayerdevelopmentpoliciesandtheirplanningforhigherproductioninIndia.
29	Constraintsin developmentand itssolution forbroiler production.
30	Constraintsin developmentand its solutionforlayer production.
31	Constraintsindevelopment anditssolutionfor backyardpoultry production.
32	Ethologyin relation to avianwelfare in intensive layer production.
33	Ethologyinrelationtoavianwelfareinintensivebackyardpoultryproduction.
34	Ethologyin relation to avian welfare in intensive broiler production.
35	Ethologyin relation to avian welfarein intensive deep litter layer production.
36	Ethologyinrelationtoavianwelfareinintensivedeep litterbroiler production.

Course Title: Recent Developments in Poultry Production Management Course

Code: LPM 709

Credit Hours: 2+1

Practical schedule

Sr. No.	Title of the topic to be covered
1	Planning, preparation of research and commercial project on small scale broiler production
2	Planning, preparation of research and commercial project on large scale broiler production.
3	Planning, preparation of research and commercial project on small scale layer production
4	Planning, preparation of research and commercial project on large scale layer production.
5	Small scale project on hatchery management.
6	Large scale project on hatchery management.
7	Commercial project on broiler breeder.
8	Commercial project on layer breeder.
9	Preparation of project report on backyard poultry farming.
10	Preparation of project report on Quails
11	Preparation of project report on duck
12	Preparation of project report on turkey
13	Preparation of project report on guinea fowl
14	Preparation of project report on emu
15	Visit to poultry slaughter houses.
16	Visit to hatchery