

Academic:

1. Degree Offered –UG, PG, PhD

Title of degree:

Duration:

Eligibility Criteria:

Intake Capacity:

Opportunities:

2. Academic Regulations:

UG , PG, PhD (VCI, ICAR, IV, V Dean's and Corrigendum) – PDF Copies

3. Admissions:

UG, PG, PhD

List of Admitted Students – First Year to Final Year (Veterinary Year wise / Fishery and Dairy Semester wise):

Sr. No.	Name of Student	Enrl. No.	Email Address	Name of Advisor
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4. 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
01	Vet. Physiology Unit -I	Blood, Cardiovascular, Nervous and Muscular systems	4+1=5	2016
	Unit- II	Physiology of Digestive and Respiratory system		To
	Unit- III	Physiology of Excretory and Endocrine system		2025
	Unit- IV	Reproduction, Lactation, Growth and Environmental Physiology		

- List of PG Courses MVSc Physiology Courses offered (2016-2024)

Sr No	Course No .	Title	Sem	Credit
01	VPY-601	Physiology of Digestion	I	2+1=3
02	VPY-602	Cardiovascular & Respiratory Physiology	I	2+1=3
03	VPY-603	Renal physiology and body fluid dynamics	I	2+1=3
04	VPY-604	Hematology	II	2+1=3
05	VPY-605	Vitamins & Minerals in Animal Physiology	II	2+0=2

06	VPY- 606	Neuromuscular Physiology	II	2+1=3
07	VPY- 607	Cardiovascular & Respiratory Physiology	II	2+1=3
08	VPY-608	Neuromuscular Physiology	III	2+1=3
09	VPY-609	Chemical Bio-regulation and Physiological function	III	3+0=3
10	VPY-610	Research Techniques in Veterinary Physiology	III	0+2=2
11	VPY-699	Master Research	IV	0+20=20

- List of PG Courses PhD Veterinary Physiology Courses offered (2016-2024)

Sr No	Course No .	Title	Sem	Credit
01	VPY-703	Comparative Physiology of Ruminant Digestion	I	2+1=3
02	VPY-704	Advances in Neuro-endocrinology	I	2+1=3
03	VPY- 706	Avian Physiology	II	2+1=3
04	VPY- 707	Physiology of lactation	II	2+1=3
05	VPY-708	Advances in environmental physiology and growth	III	2+1=3
06	VPY-711	Physiology of stress	III	2+1=3
07	VPY-791	Doctoral Seminar-I	IV	1+0=1
08	VPY-792	Doctoral Seminar-II	IV	1+0=1
09	VPY-799	Doctoral Research	IV	0+45=45

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

DEPARTMENT OF VETERINARY PHYSIOLOGY

LECTURE SCHEDULE

COURSE NAME: VETERINARY PHYSIOLOGY

Credit Hours: 4+1=5

Lecture No.	UNIT- I (BLOOD, CARDIOVASCULAR, NERVOUS AND MUSCULAR SYSTEMS) THEORY Topic
1	Introduction to blood, properties of blood as a body fluid
2	Plasma proteins, lipids - origin and function
3	R-E System, erythropoiesis, metabolism and fate of R.B.C.
4-5	Hemoglobin: chemical structure, synthesis, physiological functions, derivatives of hemoglobin
6-7	Haemorrhage; haemostasis, platelets, coagulation mechanisms and regulation of haemostasis; fibrinolysis; anticoagulation mechanism, anemia
8	Leucocyte - phagocytic and immunogenic functions
9-10	Heart: morphological characteristic, systemic excitability conduction and transmission processes
11	Cardiac cycle
12-13	Regulation of cardiac output, extrinsic and intrinsic regulation; coronary circulation, haemodynamics of circulation, circulatory mechanics, resistance to flow
14	Properties of pulse; metabolism and energetic of working myocardial cell
15	Control of blood pressure: nervous and circulating fluid volume controls of blood pressure
16-17	Circulatory controls, shock stresses, adjustment of circulation during exercise
18	Capillary exchange, regional and foetal circulation
19	Electrocardiograph, its significance in Veterinary Sciences, echocardiography.

20	Muscle Physiology: basic muscle unit characteristic
21-22	Electrical phenomenon in muscle cell: muscle action potential, excitation and propagation of impulse characteristics: latent period, refractiveness, threshold level, all and none characteristics
23	Contractile mechanism, excitation-contraction coupling, neuro-muscular transmission
24	Types of muscle contraction, phenomenon of fatigue, rigor mortis
25	Neurohormonal control of vascular smooth muscle, vasoconstriction, vasodilation
Internal assessment I (26 marks)	
26-27	Nervous System: membrane potential, ionic basis of resting membrane potential (RMP), nerve action potential, excitation and propagation of impulse characteristics. Latent period, refractiveness, threshold level, all and none characteristics. Degeneration and regeneration of nerve fibre
28	Basic functional unit (neuron) structure, type, functional characteristics of sub-units of neuron
29-30	Mechanism of information processing, synaptic and junctional transmission and neurotransmitters, types and functions of nerve fibers
31	Organization of nervous system, functions of nervous system (brain, spinal cord), hierarchical control
32	Autonomic nervous system and visceral control
33-34	Reflexes (reflex arc, action, types of reflexes); mid brain, reticular formation and functions; control of posture and movements.
35	Major function system - sensory, consciousness, emotion, motor and visceral control, wakefulness and sleep cycle
36	Higher function of neurons system - learning, memory; electroencephalography
37-38	Sense organs and receptors physiology of special senses: Eye: functional morphology, nourishment and protection neural pathway, receptors; optics, ocular muscles and movements, photochemistry, vision defects
39	Ear: Physiology of hearing and common hearing impairment, vestibule apparatus
40	Physiology of olfaction and taste
Internal assessment II (15 marks)	

UNIT-II (DIGESTIVE AND RESPIRATORY SYSTEMS)

UNIT-II THEORY

Lecture No.	Topic
1	Introduction. Morphological characteristic of monogastric and poly-gastric digestive system
2	Developmental aspects of digestion, prehension, mastication
3	Details of rumen and rumen environment, rumination
4-5	Regulation of secretory functions of saliva, salivation, stomach and intestine
6	Pancreas and bile secretion
7-8	Digestion (enzymatic and microbial) in monogastric animals. Luminous, membranous and microbial (fermentative) digestion in monogastric intestine.
9-10	Digestion (enzymatic and microbial) in ruminants. Luminous and membranous and microbial (fermentative) digestion in rumen, modification of toxic substances in rumen
11	Permeability characteristics of intestine, forces governing absorption, control of intestinal transport of electrolyte and water
12	Hunger, appetite control, defecation and vomition
13	Digestion in birds.
Internal assessment I (14 marks)	
14	Functional morphology of respiratory apparatus, mechanics of breathing

15-16	Exchange of gases in lungs and tissues. Pressures, recoil tendency, elasticity, surfactants, pleural liquid and compliance
17-18	Transport of blood gases, dissociation curves, foetal and neonatal oxygen transport
19-20	Neural and chemical regulation of breathing, diffusion, perfusion and hypoxia
21	Frictional resistance to air flow, airways smooth muscle contraction, respiratory muscle work and panting
22-23	Adaptation of respiration during muscle exercise, high altitude hypoxia, non-respiratory lung functions
24	Respiration in birds
Internal assessment II (11 marks)	

Lecture No.	UNIT-III (EXCRETORY AND ENDOCRINE SYSTEMS) Topic
1	Kidney: functional morphology of nephrons
2	Factors determining filtration pressure, determination of glomerular filtration rate (GFR) and renal plasma flow
3-4	Urine formation: re-absorption mechanisms for glucose, protein, amino acids, electrolytes and ammonium; glomerulo-tubular balance
5	Urine concentration: micturition, uremia
6	Methods of studying renal functions
7	Formation and excretion of urine in birds
Internal assessment II (7 marks)	
8-9	Fluid, water balance, fluid therapy, dehydration, water concentration mechanisms and thirst
10-11	Acid base balance and H ⁺ regulation, correction and evaluation of imbalances, total osmotic pressure
12	Cerebrospinal fluid, synovial fluids: composition, formation and flow; joints
13	Regulation of bone metabolism and homeostasis
14-15	Hormone cell interaction (receptors), sub-cellular mechanisms, metabolism of hormones
16	Mechanism of hormone regulation, methods of study of endocrine system
17	Hypothalamo-hypophyseal hormones - development of the gland, location, histological details/ cells, hormones
18	Hypothalamo-hypophyseal hormones - chemistry of hormones, control, physiological actions, dysfunctions
19-20	Thyroid: development of the gland, location, histological details / cells, hormones, chemistry and synthesis of hormones, control, physiological actions
21	Thyroid: dysfunctions ; hypo- and hyper-thyroidism, goiter and types, treatment etc
22	Pancreas: development of the gland, location, histological details / cells, hormones
23	Pancreas: chemistry of hormones, control, physiological actions, dysfunctions – diabetes mellitus
24-25	Adrenals: adrenal cortex - development of the gland, location, histological details / cells, hormones, chemistry and synthesis of hormones, control, physiological actions, dysfunctions – Cushing syndrome etc. Renin-angiotensin mechanism
26	Adrenals: adrenal medulla - development of the gland, location, histological details / cells, hormones, chemistry and synthesis of hormones, control, physiological actions, differences and similarities
Internal assessment III (19 marks)	

27	Hormones of calcium metabolism: parathyroid gland - development of the gland, location, histological details / cells, hormones, control, chemistry of hormones, physiological actions, dysfunctions
28-29	Hormones of calcium metabolism: calcitonin and vitamin D, disorders and differences
30	Erythropoietin, atrial natriuretic factors and pheromones
31-32	Thymus, pineal, prostaglandins
33	GI hormones, leptin, ghrelin

THEORY	UNIT-IV (REPRODUCTION, LACTATION, GROWTH AND ENVIRONMENTAL PHYSIOLOGY)
Lecture No.	Topic
1-2	Genetic and endocrine control of gonadal development, modification of gonadotrophin release, puberty and photoperiod
3	Functional anatomy of female reproductive tract
4-5	Ovarian functions, oogenesis, follicular development, dynamics, endocrine and receptor profiles, ovarian cycle
6-7	Ovulation, ovum transport, progestogens, estrogens, sexual receptivity
Internal assessment II (7 marks)	
8	Oestrous cycle, reproductive cycles in farm animals, post-partum ovarian activity
9-10	Functional anatomy of male reproductive tract, testosterone - functions and regulation, cryptorchidism, uses of androgens
11	Spermatogenic cycle and wave: functions of sertoli cell and leydig cell, semen – composition and evaluation, capacitation
12	Mating, fertilization
13	Pregnancy/ gestation: period of ovum, embryo and foetus, hormones present in the biological fluids during pregnancy and their uses for the diagnosis of pregnancy
14	Placentation: types and functions, maternal foetal placental participation in pregnancy and parturition, immunology of gestation
15	Parturition: preparturient endocrine status
16	Functional and metabolic organization of mammary glands: structure and development; effect of estrogens and progesterone
17	Hormonal control of mammary growth; lactogenesis and galctopoiesis
18	Biosynthesis of milk constituents, secretion of milk and metabolism, prolactin and lactation cycle
19	Clinical aspects of endocrine - reproductive functions
20-21	Growth: concept, cellular hyperplasia and hypertrophy and other aspects etc. Biochemical and genetic determinants of growth, regulation of growth, metabolic and hormone interactions
22	Developmental Horizons - organogenesis, growth curves
23	Factors affecting efficiency of growth and production in ruminants and simple stomach animals
24	Growth in meat producing animals and birds, protein deposition in animals and poultry
25	Recombinant gene transfer technologies for growth manipulation: advantages and limitations
26	Effect of climate on growth
27	Climatology: various parameters and their importance, climate, weather, concepts, macro and micro climate
28-29	Body temperature and hibernation, thermoregulation in farm animals, role of skin, responses of animals to heat and cold
Internal assessment III (21 marks)	

30-31	Heat exchange mechanisms, heat balance, heat tolerance, thermoneutral zone, hypothermia, hyperthermia and fever
32	Acclimation, acclimatization - general adaptive syndrome. Circadian rhythm
33	Temperature regulation in birds
34	Effect of different environmental variables like temperature, humidity, light, radiation, altitude on animal performance
35-36	Types of behaviour, neurophysiology of behaviour, communication, learning and memory, behavioural plasticity

COURSE NAME:-VETERINARY PHYSIOLOGY

Credit :- 4+1=5

PRACTICAL SCHEDULE	
UNIT-I	
Sr. No.	Topic
1	Collection and preservation of blood
2	Enumeration of erythrocytes
3	Enumeration of leucocytes
4	Determination of differential leukocyte count(dlc)
5	Platelet count
6	Estimation of haemoglobin
7	Erythrocytic sedimentation rate, packed cell volume, haematological indices
8	Coagulation time, bleeding time, erythrocytic fragility & blood grouping
9	Electrocardiography
10	Measurement of blood pressure
11	Effect of vagous stimulation heart:vagal escape all or one law
12	Pithing of frog and preparation of nerve muscle, recording of twitch response- effect of single stimulus, effect of heat and cold on simple muscle, effect of fatigue on muscle contraction, to record the effect of tetanization of the muscle
UNIT-II PRACTICAL SCHEDULE	
1	Collection and physical examination of rumen liquor
2	Bacterial count in rumen liquor
3	Protozoal count in rumen liquor
4	Estimation of volatile fatty acid (vfa) content in ruminal liquor
5	Estimation of ammonia nitrogen in rumen liquor
6	<i>in-vitro</i> action of proteolytic enzymes- amylase
7	<i>in-vitro</i> action of proteolytic enzymes – pepsin and trypsin
8	Recording of respiration
9	Spirometry - recording of volume and capacities in different physiological states including determination of vital capacities
10	Counting of ruminal motility and recording of rumino- intestinal movements (demonstration)

UNIT-III PRACTICAL SCHEDULE	
Sr. No.	Topic
1	Urine analysis - physiological constituents
2	Urine analysis - pathological constituents
3	Determination of glomerular filtration rate

4	Titration acidity of urine
5	Determination of inorganic phosphorus in urine
6	Determination of ammonia nitrogen in urine
7	Determination of creatinine in urine
8	Bioassay for tropic hormone.
9	Demonstration of hormone estimation
1	Oestrous and phases of oestrous cycle in farm animals (vaginal mucus), behavioural signs of oestrus
UNIT-IV	PRACTICAL SCHEDULE
2	Behaviour of animals (mating behaviour, milking behaviour, feeding behaviour)
3	Sperm motility, sperm concentration
4	Live, dead & abnormal sperm count
5	Measurement of growth in different species of domestic animals, measuring the surface area
6	Health Parameters of animals Body Temp. pulse, Respiration, and Heart rate.
7&8	Measurement of animal environmental conditions. (temperature, humidity, wind parameters, evaporation, rainfall / precipitation)

SCHEDULES OF UNITS WILL BE CONDUCTED SIMULTANEOUSLY

UNIT	THEORY	PRACTICAL
I Blood, Cardiovascular, Nervous and Muscular Systems	40	12
II Digestive and Respiratory Systems	24	10
III Excretory and Endocrine Systems	33	9
IV Reproduction, Lactation, Growth and Environmental Physiology	36	8
GRAND TOTAL	133	39

UNIT WISE SCHEDULE AND DISTRIBUTION OF MARKS FOR INTERNAL ASSESSMENT

Unit	Internal assessment I		Internal assessment II		Internal assessment III	
	No. of lectures	Marks	No. of lectures	Marks	No. of lectures	Marks
Unit I	1-25	26	26-40	15	--	--
Unit II	1-13	14	14-24	11	--	--
Unit III	--	--	1-7	07	8-26	19
Unit IV	--	--	1-7	07	8-29	21
Total	--	40	--	40	--	40

Schedule of units I and II will be continued simultaneously. After completion of this schedule the units III and IV will also be simultaneously executed.

Maharashtra Animal and Fishery Sciences University, Nagpur
Department of Veterinary Physiology

LECTUREWISE TEACHING SCHEDULE M.V.Sc

Theory	PHYSIOLOGY OF DIGESTION
VPY-601	Credits:2+1=3
Sr.No.	Topics
1-2	Basic characteristics and comparative physiology of digestive system of domestic animals
3-4	Gastro intestinal motility
5-10	secretary functions of gastro intestinal tract and their regulation
11-12	gastro intestinal hormones
13-16	Absorption, metabolism, and excretion of various nutrients
17-18	Appetite and control of feed intake
19-20	Development of ruminant system and rumen environment
21-24	Ruminant microbial digestion, its advantages and disadvantages
25-26	Rumino-reticular motility, its significance and control
27	Rumen microbiology
28	Digestion of birds

Practical	PHYSIOLOGY OF DIGESTION
VPY-601	Credits:2+1=3
Sr.No.	Topics
1	Collection of saliva and its enzymatic studies.
2	Activity of pepsin and trypsin enzymes.
3	Gastric and intestinal motility.
4	Estimation of digestive metabolites such as glucose, ketone bodies, triglycerides, Cholesterol, urea nitrogen and total proteins.
5	Estimation of digestive metabolites such as glucose, ketone bodies, triglycerides, Cholesterol, urea nitrogen and total proteins.
6	Estimation of digestive metabolites such as glucose, ketone bodies, triglycerides, Cholesterol, urea nitrogen and total proteins.
7	Liver function tests.
8	Methods of collection of rumen liquor, merits and demerits.
9	Determination of pH, total volatile fatty acids, ammonia-nitrogen and total-nitrogen in strained rumen liquor.
10	Determination of pH, total volatile fatty acids, ammonia-nitrogen and total-nitrogen in strained rumen liquor.
11	Determination of pH, total volatile fatty acids, ammonia-nitrogen and total-nitrogen in strained rumen liquor.
12	Rate of passage of digesta and its estimation.
13	Rumino-reticular movements.
14	Artificial rumen, counting of protozoa and bacteria.
15	Artificial rumen, counting of protozoa and bacteria.

Theory	CARDIOVASCULAR AND RESPIRATORY PHYSIOLOGY
VPY-602	Credits:2+1=3
Lect.No.	Topics
1	Heart muscle, heart as pump, origin and propagation of heart beat.
2	Electrophysiology of heart, rhythmic excitation of heart, cardiac cycle.
3	Electrophysiology of heart, rhythmic excitation of heart, cardiac cycle.
4	Electrophysiology of heart, rhythmic excitation of heart, cardiac cycle.
5	Heart sound and dynamics of valvular and congenital heart defect.

6	Cardiac output and its measurements, factors affecting cardiac output, Venous return and its regulation.
7	Cardiac output and its measurements, factors affecting cardiac output, Venous return and its regulation.
8	Control of the heart.
9	Control of the heart.
10	Normal electro-cardiogram.
11	Electrocardiographic interpretation in cardiac myopathies and cardiac arrhythmias.
12	Electrocardiographic interpretation in cardiac myopathies and cardiac arrhythmias.
13	Circulation and hemodynamics.
14	Coronary, systemic and pulmonary circulation and their regulation.
15	Coronary, systemic and pulmonary circulation and their regulation.
16	Coronary, systemic and pulmonary circulation and their regulation.
17	Energetics of circulation, pathophysiology of circulation
18	Energetics of circulation, pathophysiology of circulation
19	Respiration, mechanism of ventilation
20	Respiration, mechanism of ventilation
21	Hemoglobin
22	Oxygen and carbondioxide transport. Respiratory gas exchange.
23	Oxygen and carbondioxide transport. Respiratory gas exchange.
24	Oxygen and carbondioxide transport. Respiratory gas exchange.
25	Respiratory adjustment at high altitude and deep swimming.
26	Neural and chemical control of respiration, artificial respiration.
27	Neural and chemical control of respiration, artificial respiration.
28	Respiration in birds.

Practicals	CARDIOVASCULAR AND RESPIRATORY PHYSIOLOGY
	VPY-602 Credits:2+1=3 Sem:I
Pract. No.	Topics
1	Determination and recording of cardiac output.
2	Determination and recording of Blood pressure.
3	Determination and recording of electrocardiogram.
4	Determination and recording of electrocardiogram.
5	Determination and recording of blood volume.
6	Determination and recording of blood volume.
7	Estimation of lung volumes and capacities by spirometry.
8	Estimation of lung volumes and capacities by spirometry.
9	Effect of various levels of exercise on lung functional capacities.
10	Effect of various levels of exercise on lung functional capacities.
11	Estimation of blood gases.
12	Estimation of blood gases.

Theory	RENAL PHYSIOLOGY AND BODY FLUID DYNAMICS
	VPY-603 Credits: 2+1=3 Sem:I
Lect.No.	Topics
1	An overview of nephron structure and function.
2	An overview of nephron structure and function.
3	Renal homeostatic function and renal excretory function.
4	Renal homeostatic function and renal excretory function.

5	Renal homeostatic function and renal excretory function.
6	Quantitative analysis of renal function.
7	Renal haemodynamics.
8	Glomerular filtration- its mechanism and measurement.
9	Glomerular filtration- its mechanism and measurement.
10	Glomerular filtration- its mechanism and measurement.
11	Selectivity permeability of the glomerular capillary wall, structural basis of GFR.
12	Selectivity permeability of the glomerular capillary wall, structural basis of GFR.
13	Selectivity permeability of the glomerular capillary wall, structural basis of GFR.
14	Tubular reabsorption and transport.
15	Tubular reabsorption and transport.
16	Tubular reabsorption and transport.
17	Role of kidney in acid-base balance.
18	Role of kidney in acid-base balance.
19	Physiology of micturition, endocrine control of renal function
20	Physiology of micturition, endocrine control of renal function
21	Non excretory functions of kidney.
22	Skin-general anatomy of epidermis, dermis, hypodermis, mechanical protection, permeability, actinic irradiation.
23	Sweat glands, sebaceous glands.
24	Skin grafting. Immune properties of skin.
25	Composition of body fluids and their regulation.
26	Composition of body fluids and their regulation.
27	Composition of body fluids and their regulation.
28	Excretory system in birds.

Practicals	RENAL PHYSIOLOGY AND BODY FLUID DYNAMICS
	VPY-603 Credits: 2+1=3 Sem:I
Pract. No.	Topics
1	Collection and preservation of urine.
2	Physical and chemical analysis of urine and its interpretation in health and diseases condition.
3	Physical and chemical analysis of urine and its interpretation in health and diseases condition.
4	Physical and chemical analysis of urine and its interpretation in health and diseases condition.
5	Demonstration of various kidney function tests.
6	Demonstration of various kidney function tests.
7	Demonstration of various kidney function tests.
8	Demonstration of measurement of Glomerular filtration rate.
9	Demonstration of Creatinine clearance reate.
10	Demonstration of Urea clearance rate.
11	Demonstration of Glucose tolerance test.
12	Demonstration of Glucose tolerance test.
13	Demonstration of Glucose tolerance test.

Theory	Haematology
	VPY-604 Credits: 2+1=3 Sem:II
Lect.No.	Topics
1-2	Red blood cells
3-4	Anemia, different types of anaemia, polycythemia

5-6	Effects of anemia and polycythemia on circulation in mammals and birds
7-10	Resistance of the body to infection: leucocytes, tissue macrophage system and inflammation
11-13	Immunity, immunoglobulin, and immunogenetics
14-16	Polymorphism in hemoglobin, transferrin etc
17-19	Changes in blood during diseases
20	haemostasis and coagulation factors, role of platelets, fibrinolysis
21-23	blood groups, transfusion of blood
24-26	tissue and organ transplantation
27-28	Conditions causing bleeding disorders
Practical	Topics
1-4	Preparation of Hamogram
5	platelet count
6	erythrocyte fragility
7-8	estimation of serum, iron, and iron binding capacity of plasma
9	Separation of variants of hemoglobin by electrophoresis
10	Separation of transferrin by electrophoresis
11	examination of bone marrow
12	Isolation of different types of blood cells by sedimentation and column chromatography

	Vitamins and Minerals in Animal Physiology		
Theory	VPY- 605	(2+0=2)	Semester- II
Lecture	Topics		
1-2	Introduction and brief history		
3-5	Definition, general properties and overview of functions.		
6-11	Fat soluble vitamins, their functions and deficiency diseases.		
12-18	Water soluble vitamins and vitamin - like compounds, their functions and deficiency diseases.		
19-22	Physiological functions of major elements, their role in metabolism, toxicity, deficiency diseases.		
23-28	Physiological functions of trace elements, their role in metabolism, toxicity, deficiency diseases.		

	Physiology of Animal Reproduction		
Theory	VPY- 606	(2+1=3)	Semester- II
Lecture	Topics		
1-2	Functional histo-morphology of male reproductive system, development of male sex organs.		
3-4	Functional histo-morphology of female reproductive system, development of female sex organs.		
5-8	Endocrine and neuroendocrine relation in male and female reproductive function in different domestic animals.		
9-10	Sexual cycles and mating behaviours in females.		
11-13	Oogenesis, folliculogenesis and ovulation.		
14-15	Secretions of female reproductive tract in different species of animals.		
16	Male mating behaviour.		
17-19	Spermatogenesis, spermiogenesis, Seminiferous epithelial cycles.		
20-22	Spermatozoa : Structure and composition, maturation and transportation.		
23	Secretions of male reproductive tract.		

24	Transport of male and female gametes.
25	Fertilization, impaltation.
26-27	Pregnancy and parturition.
28	Post-partum recovery in different species of domestic animals.
Pactical	
1-3	Heat detaction in different animals.
4-5	Palpation of reproduction organs.
6-8	Physical and biochemical evaluation of semen
9-11	Determination of sperm enzyme & leakage during freezing.
12	Preservation of semen
13. 14	RIA of steroid hormones.

	Clinical Physiology		
Theory	VPY- 607	(2+1=3)	Semester- II
Lecture	Topics		
1-4	Cardiovascular & respiratory evaluation of body functions in relation to clinical conditions.		
5-8	Hepatic and renal evaluation of body functions in relation to clinical condition		
9-10	Carbohydrate metabolism in health and disease of various species.		
11-12	Fat metabolism in heath and disease of various species.		
13-14	Protein metabolism in health and disease of various species.		
15-17	Mineral metabolism in health and disease of various species.		
18-19	Functions and dysfunctions of liver.		
20-21	Functions and dysfunctions of Kidney.		
20-23	Functions and dysfunctions of gastrointestinal tract.		
24-25	Clinico-immunological evaluation of immune responses.		
26-28	Clinecal enzymology		
Practical	Practical		
1-2	Qualitative tests for glucose, ketone bodies, protein and calcium in urine.		
3	Quantitative determination of glucose in blood.		
4	Quantitative determination of glucose in Urine.		
5-6	Electrophoresis of plasma proteins.		
7-8	Determination of sodium and potassium in serum		
9	Determination of serum chloride.		
10-11	Separation of amine acids.		
12-14	Thin-layer chromatography of serum lipids.		

	Neuromuscular Physiology		
Theory	VPY- 608	(2+1=3)	Semester- III
Lecture	Topics		
1-2	Types and classification of muscles, comparative histopathology of muscles		
3-5	Properties of skeletal muscle fibers, membrane and action potential at myo-neuronal junction		
6-8	Molecular characteristics of contractile filamentsm molecular mechanism of muscle contraction		
9-11	Relationship between actin and myosin filaments, overlap and tension developed by the contracting muscles.		
12	Contractile process of smooth muscles		
13	Length and tension relationship, force and velocity relationship of skeletal muscle		
14-15	Skeletal muscle energetics, metabolism and lactate shuttle		

9-10	Demonstration of recording of GI tract movement using physiograph
11-12	Working principle handling and use of gas liquid chromatography
13-14	Working principle handling and use of electrophoresis
15-16	Estimation of body fluid electrolytes using flame photometer
17	Estimation of bacterial production rate
18-19	Estimation of VFA production rate
20-21	Estimation of rumen digesta flow rate using marker (chromium) excretion kinetics
22-23	Estimation of rumen water flow rate using PEG excretion kinetics
24	Demonstration of quantitative analysis of protein hormones using ELISA techniques
25	Demonstration of quantitative analysis of protein hormones using RIA techniques
26	Demonstration of quantitative analysis of steroid hormones using RIA techniques
27	Demonstration of quantitative analysis of amine hormones using RIA techniques
28	Estimation of body composition using Radio isotopes techniques
29	Demonstration on in vitro and in sacco rumen studies.

Maharashtra Animal and Fishery Sciences University, Nagpur

Department of Veterinary Physiology

LECTUREWISE TEACHING SCHEDULE Ph.D

Theory	COMPARITIVE PHYSIOLOGY OF RUMINANT DIGESTION
	VPY-703 Credits:2+1=3 Sem:I
Sr.No.	Topics
1-2	Functional development of ruminal stomach
3-4	Rumen motility and its control
5-6	Salivary secretion and its regulation
7-11	Intraruminal environment, rumen metabolites and their assimilation
12-13	NPN feeding & nitrogen recycling.
14-15	Synthesis of microbial proteins and vitamins
16-17	Rumen dysfunctions
18-20	Comparative efficiency of rumen function in different species.
21-22	Stoichiometry of carbohydrate fermentation

23-26	Manipulation of rumen fermentation, protected nutrients feeding, probiotics supplementation etc.
27-28	Rumen flow rate and rumen volume
Practical	
1-2	Recording of reticulo-ruminal motility
3-4	Artificial rumen techniques
5-7	Measurements of total volatile fatty acids and their fractions.
8-10	Counting of bacteria, protozoa and fungi in rumen
11-13	Flow rates of ruminal contents.

Theory	ADVANCES IN NEURO ENDOCRINOLOGY
	VPY-704 Credits:2+1=3 Sem:I
Sr.No.	Topics
1-2	Neuroendocrine integrating mechanism.
3-5	Structure of hypothalamus, pituitary gland in relation to endocrine function.
6	Hypothalamic releasing factors and the neuro-vascular link between brain and anterior pituitary.
7-10	Limbic and other neural pathways in relating to endocrine functions
11-12	Functions & neural control of oxytocin & ADH
13-14	Functions & control of adrenocorticotrophic hormone & aldosterone
15-19	Functions & control of thyrotrophic hormone, growth hormone & gonadotrophins.
20-21	Role of afferent impulses from genital and other regions in reproductive system.
22-23	Influence of hormones on brain activity.
24	Effects of drugs on neuro-endocrine system
25-26	Neuro-endocrine mechanisms in birds.
27-28	Interaction of nervous, endocrine and immune system in animal production and reproduction.
Practical	
1-2	Radio- immuno assay of progesterone
3-4	Effects of ovariectomy
5-6	Effects of testosterone
7-8	Bio assay of estrogens
9-10	Estimation of T3-T4 in blood

Theory	Avian Physiology
	VPY-706 Credits:2+1=3 Sem:II
Sr.No.	Topics
1-2	Anatomical structural and functions of digestive system
3	Accessory organs, motility and hormones of digestive tract
4	Secretions of digestive tract and digestion of carbohydrates
5	Absorption of carbohydrates, amino acids, volatile fatty acids and vitamins.
6	Component of blood Rh ecology, et.
7	Function of heart. Circulatory hemodynamics (arteries, veins and capillaries)
8	Arterial system, capillary beds (gas exchange, micro vascular fluid exchanging and distribution of blood flow). venous system: capacitance function, role during exercise and renal portal system.
9	Control of cardiovascular system: Hormonal and neural control of heart and peripheral blood flow.
10	Reflexes: chemoreflexes, Baroreflexes, reflexes from cardiac receptors
11	Anatomy of avian respiratory system. Ventilation respiratory mechanism
12	Pulmonary circulation, transport of gases, pulmonary gas exchange , tissue gas exchange.

13	Control of breathing. Respiratory adjustment.
14	Cross anatomy of kidney, structure of nephrons, nephron types and renal blood flow.
15	Mechanism of urine formation, regulation and excretion. Micturation.
16-17	Anatomy of female reproductive system, ovulation and partenogenesis hormones and physiological factor affecting ovulation and oviposition
18	Composition and formation of yolk, albumin, organic matrix and shell
19.	Anatomical structure of male reproductive tract. Development and growth
20-21	Hormonal control of testicular function. Serpmatogenesis and extra-godal maturation fertilization, embryo formation.
22	Factors affecting semen composition and sperm concentration
23	Comparative aspects of other endocrine glands.
24-25	Introduction and divisions of nervous system. Peripheral and central nervous system (sympathetic and parasympathetic nervous system)
26	Functional neural pathway of ANS.
27 & 28	Physiology of avian skeletal muscle. Eclectic, contractile and neuro-muscular properties of muscle fiber.
Practicks	
1-2	Study of blood cells (TEC, TLC Platelet count)
3	Differential leucocyte count
4	Estimation of haemoglobin concentration in blood
5-6	Comparative haematology (poultry, emu & turkey)
7-9	Determination of glucose, calcium uric acid phosphorus and urea in blood
10	Electrophoretic separation of plasma proteins
11	Electrophoretic separation of egg proteins.
12	Study of reproductive and endocrine organs.
13-14	Estimation of hormones (cortisol / estrogen / testosterone).

Theory	Physiology of lactation
VPY-707	Credits:2+1=3
Sr.No.	Topics
1-2	Structure and function of mammary gland : anatomy, basis of classifiction, ultra structure of mammary cell
3	Comparative mammary anatomy of domestic animals
4	Mammary gland histology and cytology
5	Mamary development: Mammogenesis, Parenchymal tissue
6	Early embryo, sex differentiation, teat formation, at birth, role of hormones in foetal development.
7	Prepubertal development: pre-weaning mammary development, isometric allometric growth, energy intake, exogenous growth hormone.
8	Postpubertal development: mammary strutures, cyclic vs acyclic, hormonal regulation, autocrine / paracrine.
9	Lobuloalvelolar development and hormones during pregnancy (oestrogen, progesterone, prolactin, growth hormone, lacental lactogen, relaxin, insulin and thyroid hormones)
10-12	Lactogenesis: principles of lactogenesis, cytologic and enzymatic differentiation copious milk secretion and hormones (progesterone lactogenic complex of hormones, insulin, gluco-corticoids and prolactine, etc.)
13	Cytological aspects of milk formation and secretion before and after parturition
14-15	Mammary biochemical changes during laction: Quantitative aspects of uptake of milk precursors. Biosynthesis of major milk constituent. Regulation of mammary enzymes.
16-17	Galactopoeisis : galactopoietic hormones, removal of milk

18	Milk composition of different animal species
19	Factors affecting composition of milk
20	Physiology of involution: Maintenance of function, lactation in decline, bovine mammary involution, apoptosis, Dry period, Dry period & mastitis.
21	Neural/ autocrine control of lactation: local factors, feedback inhibitor of lactation, when milk is removed and when milk is not removed
22	Physiology of milk ejection / let-down : milk ejection reflex, afferent and efferent pathway, inhibition of milk ejection
23	Induced lactation
24	Physiological means of optimizing milk production, use of rBST for increasing milk production
25	Residual Milk : proportion of residual milk, oxytocin and residual milk and proportion of milk present.
26-27	Physiology of milk secretion: factors affecting, secretion rate and inhibition of secretion, effects of season.
28	Milking Frequency and Interval effects on milk yield: Frequency of milk removal, 3X/ day Vs 2X/day, response to 3x/day and other frequencies.
Practicals	
1	Examination of mammary gland samples (from abattoir) of cow and buffalo
2	Effect of adrenalin and oxytocin on milk letdown
3-4	Artificial induction of lactation
5	Estimation of proteins in milk and colostrum during different stages of lactation
6-7	Estimation of lactose in milk and colostrum during different stages of lactation
8-9	Estimation of fat in milk and colostrum during different stages of lactation
10-11	Estimation of ash in milk and colostrum during different stages of lactation
12-14	Estimation of lactogenic hormones viz prolactin, progesterone

Theory	Advances in Environmental Physiology and Growth
	VPY-708 Credits:2+1=3 Sem:III
Sr.No.	Topics
1	Ecology and Ecotudies Ecology of farm animals, domestication and geographical distribution, biodiversity, biosphere and extinction
2	Components of physical environment, biometeorology, climate macro and micro climate
3	Seasons and seasons, India meteorological Department (International meteorological organization)
	Thermoregulation
4-5	Thermoneutral zone-concept, factors affecting and measurement. Critical temperature adaptation (Acclimation and acclimatization). Adaptation- Homeostasis, hibernation/aestivation, stress syndromes, Biological rhythm (Biological rhythms, mammalian circadian rhythms, their regulation)
6	Principle of thermoregulation in mammals and birds. Normal body temperatures and factors affecting it. Core temperature and compartments of body temperature
7	Physiological response of farm animals to heat and cold-respiration, circulatory, pulse rate, vasoconstriction and vasodilation, counter current heat exchange rate.
8	Responses to fast and slow changes, metabolism, production and reproduction
9	Role of CNS (Hardy's model/ Heuristic model), hypothalamus, neuroendocrine control
10	Hyperthermia and hypothermia-mechanisms and uses/significance
11	Physical (Conduction, convection and radiation, Evaporation –estimations and derivations) and chemical regulation (BMR, secretions, minerals and water metabolism in seasonal changes –thirst and hunger)

12	Energy regulation (Heat loss and gain mechanisms), feeding respiration, and metabolism, panting and sweating (sweat gland and control)
13	Energetics of respiration (panting), sweating, and shivering for thermoregulation – oxidative phosphorylation and ATP production-Lohman reaction (Exercise and muscular work) Shivering
14	Reactions of species to exposure to climatic variation /extremes
15	Failure of thermoregulation-Climatic stress and heat/cold stroke
	Climatology : Effects on Health and production)
16	Effects of various climatic components- temperature, humidity and precipitation, wind vapour pressure on health and production, reproduction
17	World scenario, global warming, contribution of GHGs and, modernization probable calamities, techniques and suggestions over risks and remedies, Disaster management for animals , Definition of natural calamities
	(Growth Physiology Pre and post natal growth)
18	Concept and definition of cellular growth –divisions, cleavage, differentiation, metamorphosis.
19.	Prenatal (Embryonic and foetal periods)-measurement, organogenesis
20	Factors affecting prenatal growth
21	Absolute , relative and specific growth and interpretations-modern techniques sonographic parameters and reading reports –parameters –body weight and other parameters
22	Postnatal growth (pre-post-pubertal) patterns in different species of domestic animals, growth curve.
23	Body conformation and characteristics , surface area and growth
24	Neuroendocrine control, climatic control and adaptive growth/mutations and alterations
	Control and factors affecting growth
25 and 26	Growth regulators and other factors affecting live weight growth viz. nutrition, hormones, vitamins, antibiotics, environment, probiotics, therapeutics of growth regulators, recombinant hormones as growth regulators.
27	Ageing and senescence , maintenance
28	Growth anomalies (Dwarfism-nutritional and climatic, gigantism/acromegaly)

Theory	Physiology of stress VPY-711 Credits:2+1=3 Sem:III
Sr.No.	Topics
1	Stress- Definition, Introduction and concept. Types of stress. Physiological significance of stress, stress as an example of adaptive measures
2, 3 and 4	Physiology of stress (Mechanism) Involvement of CNS, CVS, Respiratory, endocrine, reticuloendothelial systems and blood. Endocrine mechanism –hormones of stress
5 and 6	Energetic of stress. Metabolism. Effects on metabolic/basal metabolic rate, Significance, physico-chemical changes of blood composition
7 and 8	General adaptation syndrome, cannons emergency responses and stress as a syndrome
9, 10 and 11	Types of stress (In detail) Nutritional stress-Ingredients (carbohydrates, proteins, lipids, mineral and vitamins) Deficiency syndrome hazards and geographical reference
12	Climatic stress, effects of temperature and humidity
13	Mechanism of stress due to exposure to heat and cold
14	Mechanism of stress due to exposure to other weather and climatic factors geographical references
15 and 16	Social stress, emotional stress, involvement of CNS, CVS, Endocrine system

17 and 18	Exercise and work stress, capacity of work under field and controlled laboratory conditions, factors and regulate it.
19	Transportation stress (Details)
20 and 21	Effect of various stresses on endocrine states of animals (Summarized)
22 and 23	Endurance's in animals (species wise differences)-towards adaptability and habituation
24	Production stress-Dairy and meat animals, egg production
25	Reproduction stress-Physiological states-oestrous cycle, pregnancy, parturition, lactation
26 and 27	Behaviour in stress and stress in behaviour
28	Species-wise studies and discussion on various experiments in history
Practicals	Name of Practical
	Demonstration and experiments on stress due to
1	Deprivation of food
2	Deprivation of water
3	Isolation
4	Exposure to heat and cold
5	Exercise
6	Measurement of hormones during stress-due to –isolation (adrenocortical and adrenomedullary hormones)
7	Measurement of hormones during stress-due to isolation Oestrous cycle (Thyroid and adrenocortical hormones)
8	Measurement of hormones during stress-due to-isolation Pregnancy (Thyroid and adrenocortical hormones)
9	Measurement of hormones during stress-due to isolation lactation (thyroid and adrenocortical hormones)
10	Stepwise study-measurement of hormones during stress-due to-isolation lactation (thyroid and adrenocortical hormones)
11	Measurement of cardio-respiratory reaction during-isolation
12	Measurement of cardio-respiratory reaction during-exercise and work
13	Stepwise demonstration and comparative study of effect of deprivation of water
14	Studies of transportation stress (Clinical cases)

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

DEPARTMENT OF VETERINARY PHYSIOLOGY

LECTURE SCHEDULE 2024-2025

COURSE NAME: VETERINARY PHYSIOLOGY

Credit Hours: 4+1

THEORY Lecture	Dates	UNIT I : BLOOD, CARDIOVASCULAR, NERVOUS AND MUSCULAR SYSTEMS Topic
		Course teacher -Dr.Prajwalini Thakur
1	21/10/24	Introduction to blood, properties of blood as a body fluid
2	24/10/24	Plasma proteins, lipids - origin and function
3	28/10/24	R-E System, erythropoiesis, metabolism and fate of R.B.C.
4-5	30/10/24 and 04/11/24	Hemoglobin: chemical structure, synthesis, physiological functions, derivatives of hemoglobin
6-7	07/11/24 and 11/11/24	Haemorrhage; haemostasis, platelets, coagulation mechanisms and regulation of haemostasis; fibrinolysis; anticoagulation mechanism, anemia

8	14/11/24	Leucocyte - phagocytic and immunogenic functions
9-10	18/11/24 and 21/11/24	Heart: morphological characteristic, systemic excitability conduction and transmission processes
11	25/11/24	Cardiac cycle
12-13	28/11/24	Regulation of cardiac output, extrinsic and intrinsic regulation; coronary circulation, haemodynamics of circulation, circulatory mechanics, resistance to flow
14	02/12/24	Properties of pulse; metabolism and energetic of working myocardial cell
15	05/12/24	Control of blood pressure: nervous and circulating fluid volume controls of blood pressure
16-17	09/12/24 and 12/12/24	Circulatory controls, shock stresses, adjustment of circulation during exercise
18	16/12/24	Capillary exchange, regional and foetal circulation
19	23/12/24	Electrocardiograph, its significance in Veterinary Sciences, echocardiography.
20	26/12/24	Muscle Physiology: basic muscle unit characteristic
21-22	30/12/24 and 02/01/25	Electrical phenomenon in muscle cell: muscle action potential, excitation and propagation of impulse characteristics: latent period, refractiveness, threshold level, all and none characteristics
23	06/01/25	Contractile mechanism, excitation-contraction coupling, neuro-muscular transmission
24	09/01/25	Types of muscle contraction, phenomenon of fatigue, rigor mortis
25	16/01/25	Neurohormonal control of vascular smooth muscle, vasoconstriction, vasodilation
Internal assessment I (26 marks)		
26-27	19/01/25	Nervous System: membrane potential, ionic basis of resting membrane potential (RMP), nerve action potential, excitation and propagation of impulse characteristics. Latent period, refractiveness, threshold level, all and none characteristics. Degeneration and regeneration of nerve fibre
28	23/01/25	Basic functional unit (neuron) structure, type, functional characteristics of sub-units of neuron
29-30	27/01/25 and 30/01/25	Mechanism of information processing, synaptic and junctional transmission and neurotransmitters, types and functions of nerve fibers
31	03/02/25	Organization of nervous system, functions of nervous system (brain, spinal cord), hierarchical control
32	06/02/25	Autonomic nervous system and visceral control
33-34	10/02/25 and 13/02/25	Reflexes (reflex arc, action, types of reflexes); mid brain, reticular formation and functions; control of posture and movements.
35	17/02/25	Major function system - sensory, consciousness, emotion, motor and visceral control, wakefulness and sleep cycle
36	20/02/25	Higher function of neurons system - learning, memory; electroencephalography
37-38	24/02/25 and 27/02/25	Sense organs and receptors physiology of special senses: Eye: functional morphology, nourishment and protection neural pathway, receptors; optics, ocular muscles and movements, photochemistry, vision defects
39	03/03/25	Ear: Physiology of hearing and common hearing impairment, vestibule apparatus
40	06/03/25	Physiology of olfaction and taste
Internal assessment II (15 marks)		

Lecture No.	Dates	UNIT-III (EXCRETORY AND ENDOCRINE SYSTEMS) Course teacher -Dr.Prajwalini Thakur
1	10/03/2025	Kidney: functional morphology of nephrons

2	13/03/2025	Factors determining filtration pressure, determination of glomerular filtration rate (GFR) and renal plasma flow
3-4	17/03/2025 and 20/03/2025	Urine formation: re-absorption mechanisms for glucose, protein, amino acids, electrolytes and ammonium; glomerulo-tubular balance
5	24/03/2025	Urine concentration: micturition, uremia
6	27/03/2025	Methods of studying renal functions
7	07/04/2025	Formation and excretion of urine in birds
Internal assessment II (7 marks)		
8-9	17/04/2025 and 21/04/2025	Fluid, water balance, fluid therapy, dehydration, water concentration mechanisms and thirst
10-11	24/04/2025 and 28/04/2025	Acid base balance and H ⁺ regulation, correction and evaluation of imbalances, total osmotic pressure
12	05/05/2025	Cerebrospinal fluid, synovial fluids: composition, formation and flow; joints
13	08/05/2025	Regulation of bone metabolism and homeostasis
14-15	15/05/2025 and 19/05/2025	Hormone cell interaction (receptors), sub-cellular mechanisms, metabolism of hormones
16	22/05/2025	Mechanism of hormone regulation, methods of study of endocrine system
17	26/06/2025	Hypothalamo-hypophyseal hormones - development of the gland, location, histological details/ cells, hormones
18	29/05/2025	Hypothalamo-hypophyseal hormones - chemistry of hormones, control, physiological actions, dysfunctions
19-20	02/06/2025	Thyroid: development of the gland, location, histological details / cells, hormones, chemistry and synthesis of hormones, control, physiological actions
21	05/06/2025	Thyroid: dysfunctions ; hypo- and hyper-thyroidism, goiter and types, treatment etc
22	09/06/2025	Pancreas: development of the gland, location, histological details / cells, hormones
23	12/06/2025	Pancreas: chemistry of hormones, control, physiological actions, dysfunctions – diabetes mellitus
24-25	16/06/2025 and 19/06/2025	Adrenals: adrenal cortex - development of the gland, location, histological details / cells, hormones, chemistry and synthesis of hormones, control, physiological actions, dysfunctions – Cushing syndrome etc. Renin-angiotensin mechanism
26	23/06/2025	Adrenals: adrenal medulla - development of the gland, location, histological details / cells, hormones, chemistry and synthesis of hormones, control, physiological actions, differences and similarities
Internal assessment III (19 marks)		
27	26/06/2025	Hormones of calcium metabolism: parathyroid gland - development of the gland, location, histological details / cells, hormones, control, chemistry of hormones, physiological actions, dysfunctions
28-29	30/06/2025 and 03/07/2025	Hormones of calcium metabolism: calcitonin and vitamin D, disorders and differences
30	07/07/2025	Erythropoietin, atrial natriuretic factors and pheromones
31-32	10/07/2025 and 14/07/2025	Thymus, pineal, prostaglandins
33	15/07/2025	GI hormones, leptin, grehlin

Lecture No.	Date	UNIT-II	DIGESTIVE AND RESPIRATORY SYSTEMS
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		Topic Dr.V.M.Sardar	Course Teacher -
1	23/10/24	Introduction. Morphological characteristic of monogastric and poly-gastric digestive system	
2	25/10/24	Developmental aspects of digestion, prehension, mastication	
3	30/10/24	Details of rumen and rumen environment, rumination	
4-5	13/11/24	Regulation of secretory functions of saliva, salivation, stomach and intestine	
6	20/11/24	Pancreas and bile secretion	
7-8	27/11/24	Digestion (enzymatic and microbial) in monogastric animals. Luminous, membranous and microbial (fermentative) digestion in monogastric intestine.	
9-10	04/12/24	Digestion (enzymatic and microbial) in ruminants. Luminous and membranous and microbial (fermentative) digestion in rumen, modification of toxic substances in rumen	
11	06/12/24	Permeability characteristics of intestine, forces governing absorption, control of intestinal transport of electrolyte and water	
12	11/12/24	Hunger, appetite control, defecation and vomition	
13	18/12/24	Digestion in birds.	
Internal assessment I (14 marks)			
14	20/12/24	Functional morphology of respiratory apparatus, mechanics of breathing	
15-16	01/01/25	Exchange of gases in lungs and tissues. Pressures, recoil tendency, elasticity, surfactants, pleural liquid and compliance	
17-18	03/01/25	Transport of blood gases, dissociation curves, foetal and neonatal oxygen transport	
19-20	15/01/25	Neural and chemical regulation of breathing, diffusion, perfusion and hypoxia	
21	22/01/25	Frictional resistance to air flow, airways smooth muscle contraction, respiratory muscle work and panting	
22-23	07/02/25	Adaptation of respiration during muscle exercise, high altitude hypoxia, non-respiratory lung functions	
24	12/02/25	Respiration in birds	
Internal assessment II (11 marks)			

THEORY	Date	UNIT-IV (REPRODUCTION, LACTATION, GROWTH AND ENVIRONMENTAL PHYSIOLOGY) Course Teacher -Dr.V.M.Sardar
Lecture No.		Topic
1-2	21/02/25	Genetic and endocrine control of gonadal development, modification of gonadotrophin release, puberty and photoperiod
3	28/02/25	Functional anatomy of female reproductive tract
4-5	05 & 12/03/25	Ovarian functions, oogenesis, follicular development, dynamics, endocrine and receptor profiles, ovarian cycle
6-7	19 & 21/03/25	Ovulation, ovum transport, progestogens, estrogens, sexual receptivity
Internal assessment II (7 marks)		
8	26/03/25	Oestrous cycle, reproductive cycles in farm animals, post-partum ovarian activity
9-10	28/03/25	Functional anatomy of male reproductive tract, testosterone - functions and regulation, cryptorchidism, uses of androgens
11	02/04/25	Spermatogenic cycle and wave: functions of sertoli cell and leydig cell, semen – composition and evaluation, capacitation
12	04/04/25	Mating, fertilization

13	09/04/25	Pregnancy/ gestation: period of ovum, embryo and foetus, hormones present in the biological fluids during pregnancy and their uses for the diagnosis of pregnancy
14	11/04/25	Placentation: types and functions, maternal foetal placental participation in pregnancy and parturition, immunology of gestation
15	16/04/25	Parturition: preparturient endocrine status
16	23/04/25	Functional and metabolic organization of mammary glands: structure and development; effect of estrogens and progesterone
17	25/04/25	Hormonal control of mammary growth; lactogenesis and galctopoiesis
18	30/04/25	Biosynthesis of milk constituents, secretion of milk and metabolism, prolactin and lactation cycle
19	02/05/25	Clinical aspects of endocrine - reproductive functions
20-21	07 & 09/05/25	Growth: concept, cellular hyperplasia and hypertrophy and other aspects etc. Biochemical and genetic determinants of growth, regulation of growth, metabolic and hormone interactions
22	14/05/25	Developmental Horizons - organogenesis, growth curves
23	16/05/25	Factors affecting efficiency of growth and production in ruminants and simple stomach animals
24	21/05/25	Growth in meat producing animals and birds, protein deposition in animals and poultry
25	23/05/25	Recombinant gene transfer technologies for growth manipulation: advantages and limitations
26	28/05/25	Effect of climate on growth
27	30/05/25	Climatology: various parameters and their importance, climate, weather, concepts, macro and micro climate
28-29	04 & 06/06/25	Body temperature and hibernation, thermoregulation in farm animals, role of skin, responses of animals to heat and cold
Internal assessment III (21 marks)		
30-31	11 & 13/06/25	Heat exchange mechanisms, heat balance, heat tolerance, thermoneutral zone, hypothermia, hyperthermia and fever
32	18/06/25	Acclimation, acclimatization - general adaptive syndrome. Circadian rhythm
33	20/06/25	Temperature regulation in birds
34	25/06/25	Effect of different environmental variables like temperature, humidity, light, radiation, altitude on animal performance
35-36	27/06/25 & 02/07/25	Types of behaviour, neurophysiology of behaviour, communication, learning and memory, behavioural plasticity

PRACTICAL SCHEDULED		COURSE NAME-VETERINARY PHYSIOLOGY		
		Credit :- 4+1=5		
UNIT-I		A Batch (Friday)	B Batch (Monday)	C Batch (Thursday)
Sr. No.	Topic			
1	Collection and preservation of blood	25/10/2024	21/10/2024	24/10/2024
2	Enumeration of erythrocytes	01/11/2024	28/10/2024	31/10/2024
3	Enumeration of leucocytes	08/11/2024	04/11/2024	07/11/2024
4	Determination of differential leukocyte count(dlc)	15/11/2024	11/11/2024	14/11/2024
5	Platelet count	22/11/2024	18/11/2024	21/11/2024
6	Estimation of haemoglobin	29/11/2024	25/11/2024	28/11/2024
7	Erythrcytic sediementation rate, packed cell volume, haematological indices	06/12/2024	02/12/2024	05/12/2024

8	Coagulation time, bleeding time, erythrocytic fragility & blood grouping	13/12/2024	09/12/2024	12/12/2024
9	Electrocardiography	20/12/2024	16/12/2024	19/12/2024
10	Measurment of blood pressure	27/12/2024	23/12/2024	26/12/2024
11	Effect of vagous stimulation heart:vagal escape all or one law	03/01/2025	30/12/2024	02/01/2025
12	Pithing of frog and preparation of nerve muscle, recording of twitch response- effect of single stimulus, effect of heat and cold on simple muscle, effect of fatigue on muscle contraction, to record the effect of tetanization of the muscle	10/01/2025	06/01/2025	09/01/2025

PRACTICAL SHEDULED				
	UNIT-II	A Batch (Friday)	B Batch (Monday)	C Batch (Thurdsay)
1	Collection and physical examination of rumen liquor	07/03/25	03/03/25	06/03/25
2	Bacterial count in rumen liquor	21/03/25	10/03/25	13/03/25
3	Protozoal count in rumen liquor	28/03/25	17/03/25	20/03/25
4	Estimation of volatile fatty acid (vfa) content in ruminal liquor	04/04/25/	24/03/25	27/03/25
5	Estimation of ammonia nitrogen in rumen liquor	11/04/25	07/04/25/	03/04/25
6	<i>in-vitro</i> action of proteolytic enzymes- amylase	25/04/25	21/04/25	17/03/25

7	<i>in-vitro</i> action of proteolytic enzymes – pepsin and trypsin	02/05/25/	28/04/25	24/04/25
8	Recording of respiration	09/05/25	05/05/25	08/05/25
9	Spirometry - recording of volume and capacities in different physiological states including determination of vital capacities	16/05/25	19/05/25	15/05/25
10	Counting of ruminal motility and recording of rumino- intestinal movements (demonstration)	23/05/25	26/05/25	22/05/25

UNIT-III				
Sr. No.	Topic	A Batch (Friday)	B Batch (Monday)	C Batch (Thursday)
1	Urine analysis - physiological constituents	25/04/25	21/04/2025	17/04/2025
2	Urine analysis - pathological constituents	02/05/2025	28/04/2025	24/04/2025
3	Determination of glomerular filtration rate	09/05/2025	05/05/2025	08/05/2025
4	Titration acidity of urine	16/05/2025	19/05/2025	15/05/2025
5	Determination of inorganic phosphorus in urine	23/05/2025	26/05/2025	22/05/2025
6	Determination of ammonia nitrogen in urine	30/05/2025	02/06/2025	29/05/2025
7	Determination of creatinine in urine	06/06/2025	09/06/2025	05/06/2025
8	Bioassay for tropic hormone.	13/06/2025	16/06/2025	12/06/2025
9	Demonstration of hormone estimation	20/06/2025	23/06/2025	19/06/2025

UNIT-IV PRACTICAL SCHEDULED				
1	Oestrous and phases of oestrous cycle in farm animals (vaginal mucus), behavioural signs of oestrus	30/05/25	02/06/25	29/05/25
2	Behaviour of animals (mating behaviour, milking behaviour, feeding behaviour)	06/06/25	09/06/25	05/06/25
3	Sperm motility, sperm concentration	13/06/25	16/06/25	12/06/25
4	Live, dead & abnormal sperm count	20/06/25	23/06/25	19/06/25
5	Measurement of growth in different species of domestic animals, measuring the surface area	27/06/25	30/06/25	26/06/25
6	Health Parameters of animals Body Temp. pulse, Respiration, and Heart rate.	04/07/25	07/07/25	03/07/25
7&8	Measurement of animal environmental conditions. (temperature, humidity, wind parameters, evaporation, rainfall / precipitation)	11/07/25	14/07/25	10/07/25

7. Academic Calendar – UG, PG, PhD -Year wise / Semester Wise
8. College Classes Time Table :UG, PG , PhD - Year wise / Semester Wise
9. Examination Time Table – UG, PG , PhD - Semester / Year wise - Theory and Practical
- 10.** Result –UG, PG , PhD - Semester Wise / Year Wise