

PURBANCHAL UNIVERSITY
FACULTY OF SCIENCE & TECHNOLOGY
P.O. Box 142
Biratnagar, Nepal

COURSES OF STUDIES
FOR
B.V.SC & A.H.

Updated version 2072

First Semester

<u>Code</u>	<u>Course</u>	<u>Cr.Hrs</u>
VAN-111	Gross Anatomy I	2+2=4
VPY-111	Veterinary Physiology I	2+1=3
VBC-111	General Veterinary Biochemistry	2+1=3
AGB-111	Biostatistics and Computer Application	2+1=3
LPM-111	General Live-stock Management	1+1=2
LPM-112	Fodder Production Grassland Management	1+1=2
AHE-111	Sociology and Principles of Veterinary and A.H. Extension	<u>2+1=2</u>
Total		12+8=20

Second Semester

<u>Code</u>	<u>Course</u>	<u>Cr.Hrs</u>
VAN-122	Gross Anatomy II	2+1=3
VAN-123	Gross Anatomy III	1+1=2
VPY-122	Vet Physiology II	2+1=3
VBC-122	Physiology Chemistry	2+1=3
VBC-123	Introduction to Molecular Biology and Biotechnology	1+1=2
AGB-122	Principle of Genetic and Population Genetics	2+1=3
LPM-123	Animal Housing Sanitation	1+1=2
AHE-122	Livestock Economics, Marketing and Business Management	<u>2+1=3</u>
Total		13+8=21

Third Semester

<u>Code</u>	<u>Course title</u>	<u>Cr.Hrs.</u>
VAN-214	Histology and Embryology	2+2=4
VPY-213	Veterinary Physiology III	2+1=3
ANU-211	Principles of Animal Nutrition	2+1=3
ANU-212	Evaluation of Feedstuff and Feed Technology	1+1=2
VPA-211	General Veterinary Parasitology	1+1=2
VMC-211	General Veterinary Microbiology	2+1=3
VPL-211	General Veterinary Pathology	2+1=3
AGB-213	Principles of Animal Breeding	<u>1+1=2</u>
Total		13+9 =22

Fourth Semester

<u>Code no.</u>	<u>Course title</u>	<u>Cr. Hrs</u>
VAN-225	Applied Anatomy	0+2=2
VPY-224	Veterinary Physiology	1+1=2
ANU- 223	Applied Nutrition-I	2+1=3
ANU- 224	Applied Nutrition-II	1+1=2
VPA –222	Veterinary Helminthology	2+1=3
VMC-222	Veterinary Immunology and Serology	2+1=3
VPL-222	Systemic Pathology	2+1=3
AGB-224	Livestock Breeding System	<u>1+1=2</u>
Total		11+9=21

Fifth Semester

<u>Code</u>	<u>Course topic</u>	<u>Cr.Hrs</u>
VPT-311	General and C.N.S. Pharmacology	2+1=3
VPA-313	Veterinary Entomology and Acarology	1+1=2
VMC-313	Veterinary Bacteriology and Mycology	2+1=3
VPL-313	Special Pathology	2+1=3
VPH-311	Veterinary Public Health (Milk Hygiene and Public Health)	1+1=2
LPM-314	Swine/Equine/Yak Production and Management	1+1=2
LPM-315	Wild and Zoo Animal Health Care and Management /Fish Production	1+1=2
LPM -316	Laboratory animals/Rabbit/Fur Animal Mgmt, and Pet Animal Care	1+1=2
LPT-311	Milk and Milk Products Technology	<u>1+1=2</u>
Total		12+9=21

Sixth Semester

<u>Code</u>	<u>Course title</u>	<u>Cr.hrs</u>
VPT-322	Autonomic and systemic Pharmacology	2+1=3
VPA-324	Veterinary Protozoology	2+1=3
VMC-324	General and Systemic Veterinary Virology	2+1=3
VPL-324	Special Pathology – II	2+1=3
VPH-322	Meat Hygiene and Public Health	1+1=2

Syllabus		B.V.Sc.& A.H
LPM-327	Sheep and Goat Production and Management	1+1=2
LPM-328	Avian Production and Management	2+1=3
LPT-322	Abatoir Practices and Animal By-Products Technology	<u>1+1=2</u>
	Total	13+8=21

Seventh Semester

<u>Code</u>	<u>Course</u>	<u>Cr. Hrs</u>
LPM-419	Livestock Production and Management (Cattle and Buffalo Production and Management)	1+1=2
VPH-413	Veterinary Public Health (Zoonoses and Human Health)	1+1=2
VPH-414	Veterinary Public Health & Enviromental Hygine	1+1=2
LPT-412	Livestock Product Technology (Meat & Meat Products Technology)	1+1=2
VSR-411	Surgery and Radiology (General Surgery and Anaesthesilogy)	2+1=3
VEP-411	Veterinary Epidemiology (Veterinary Epidemiology & Preventive Veterinary Medicine)	1+1=2
AHE-413	Veterinary & Animal Husbandary Extension (Extension Techniques in Veterinary Practice and Livestock Production)	1+1=2
VPT-413	Veterinary Pharmocology & Toxicology (Chemotherapy)	2+1=3
VBC-414	Veterinary Biochemistry (Veterinary Clinical Biochemistry)	<u>1+1=2</u>
	Total	11+9=20

Eighth Semester

<u>Course No.</u>	<u>Topics</u>	<u>Credit Hrs.</u>
VPT-424	Veterinary Toxicology	2+1=3
VOG-421	Gynaecology&Obstetrics	2+2=4
VSR-422	Radiology Regional and Clinical Surgery-I	2+2=4
VCM-421	Clinical Veterinary Medicine-I (General &Systemic)	2+2=4
VEP-422	Preventive Veterinary Medicine-I (Bacterial, Viral &Fungal diseases)	2+2=4
VFC-421	Veterinary Field Clinic (Veterinary Practice and Management)	0+2=2
VLD -421	Veterinary Laboratory Diagnosis-I (Clinics)	<u>0+2=2</u>
Total:		10+13=23

Ninth Semester

<u>Course No.</u>	<u>Course Title</u>	<u>Credit Hrs.</u>
VOG-512	Andrology and Artificial Insemination	2+2
VSR-513	Regional & Clinical Surgery-II and Lameness	2+2
VCM-512	Clinical Vet. Medicine-II	2+2
VCM-513	Vet. Ethics and Jurisprudence	1+0
VEP-513	Preventive Vet. Medicine-II	2+2

Syllabus		B.V.Sc.& A.H
VPW-511	Veterinary Proposal Writing	1+0
VAW-511	Veterinary Animal Welfare	1+0
VFC-512	Project work on Veterinary Field Clinic-II	0+2
CAVM -511	Alternative Veterinary Medicine.	<u>non credit</u>
	Total	11+10=21

Tenth semester

<u>Course code</u>	<u>Course Title</u>	<u>Credit Hrs.</u>
VIP 520	Veterinary Internship Programme (Field work - 0+6 and Seminar 0+2)	0+8

FIRST SEMESTER**Code no: VAN-111****Course title: Gross Anatomy (Locomotor System, Osteology, Arthrology, Mycology)****Cr. Hr. 2+2=4****Full mark- 100****Theory – 50****Practical – 50****Syllabus with breakdown****Theory**

Chapter		Topic	No. of Lectures
Osteology	Appendicular bones	Introduction, definition of terms used in veterinary Anatomy in general and in osteology in particular	1
		Classification of bone, physical properties of bone, structure of bones	1
		Gross study of Scapula and Humerus of ox with emphasis on their topographic, contour, landmarks, functional anatomy etc. from clinical and production point of view and its comparison with other species (sheep/goat, pig, horse, dog, rabbit and fowl)	1
		Gross study of Radius and ulna , carpus ox " "	1
		Gross study of Metacarpus, phalanges and sesamoids ox "	1
		Gross study of Pelvic bone of ox "	1
		Gross study of Femur, patella, tibia and fibula of ox " "	1
		Gross study of Tarsus, metatarsus, phalanges of ox " "	1
		Gross study of Occipital bone, parietal bone, sphenoid bone "	1
Axial skeleton(Skull/Bones of cranium,Fascial bones&Vertebrae)			

Gross study of Frontal bone, temporal bone, ethmoid bone "	1
Gross study of Maxillary, palatine, pterygoid, vomer and molar bones " "	1
Gross study of Lacrimal, turbinate, hyoid, nasal and mandible bones "	1
Gross study of Typical vertebra, cervical vertebra " "	1
Gross study of Thoracic, lumbar and sacrum vertebra "	1
Gross study of Coccygeal vertebra, thorax, ribs and sternum "	1

	Total	15
Arthrology	Introduction, classification of joints	1
	Classification of joints of forelimbs of ox/buffalo with their structure, functional anatomy and comparison with other species from clinical and production point of view	1
	Classification of joints of hind limbs of ox/buffalo "	1
	Classification of joints of head, neck, trunk of ox/buffalo "	1
	Classification of joints of forelimbs of ox/buffalo "	1
	Total	5
Myology	Introduction, classification of muscle	1
	Gross study of muscles of head and neck of ox/buffalo as a type species with their structural and functional importance from clinical and production point of view	1
	Gross study of muscles of trunk and tail of ox/buffalo "	1
	Gross study of muscles of fore limbs of ox/buffalo "	1
	Gross study of muscles of hind limbs of ox/buffalo "	1
	Comparison of structure and function with other species	1
	Total	6
	Grand Total	26

Practical

Chapter	Topic	No.of lecture
Osteology	Fore limbs	
	Gross study of scapula and humerus their structure, landmarks, angulation, wt. Bearing and function in ox/buffalo in comparison to horses, dogs, cats, goats/sheep, fowl etc.	1
	Gross study of Carpus and metacarpus " "	1
	Gross study of Phalanges and sesamoids " "	1
	Hind limbs	
	Gross study of Pelvic bone " "	1
	Gross study Femur, patella and tibia & fibula "	1
	Gross study of Tarsus, metatarsus and phalanges "	1
	Gross study of occipital, parietal, sphenoid bone; their structure, landmarks, angulation, wt. Bearing and function in ox/buffalo in comparison to horses, dogs, cats, goats/sheep, fowl etc	1
	Gross study of Frontal, temporal, ethmoid bone "	1
	Gross study of Maxillary, palatine and pterygoid bone "	1
	Gross study of Vomer, molar, lacrimal and hyoid bone "	1

	Gross study of Turbinate, nasal and mandible bone "	1
	Vertebra	
	Gross study of Cervical vertebra "	1
	Gross study of Thoracic vertebra and lumbar vertebra "	1
	Gross study of Sacral and coccygeal vertebra "	1
	Gross study of Ribs and sternum "	1
	Relation of above structures of bones in live animals	1
	Total	18
Arthology	Dissection of joints of all regions of ox/buffalo to study the structure and function	1
	Comparison of joints with other species and relation of above structures of joints in the live animals	1
	Total	2
Myology	Dissection of muscles of different region of ox/buffalo, their location and function	
	Dissection of muscle of fore limb of ox/buffalo, their location and function.	2
	Dissection of muscle of hind limb of ox/buffalo, their location and function.	2
	Dissection of muscle of head and neck of ox/buffalo, their location and function.	1
	Dissection of muscle of trunk and tail	1
	Relation of above structures of muscle in the live animals	1
	Total	7
	Total	27

References

- Anatomy of ox –ICAR publication
- Anatomy of Farm animal-Fradson, R.D.
- Anatomy of Domestic Animal-Sisson and Grossman
- Primary Veterinay Anatomy-R.K. Ghosh and A.K. Ghosh.

FIRST SEMESTER**Code:VPY- 111****Title: Physiology-I (Locomotor, cardiovascular, Respiratory system and Blood)****Cr. Hrs. 2+1=3****Full marks-75****Theory-50****Practical-25****Syllabus with breakdown****Theory**

Chapter	Topics	No. of lectures
Locomotor system	Structure of different types of muscles	1
	Mechanism of contraction, excitation of muscles, electrical stimulation, isotonic & isometric contraction effect of temp. & repetitive stimuli on contraction	1
	All or Non law , refractory period ,fatigue, rigor mortis	1
	Chemical composition of muscle, chemical and thermal changes during muscular contractions, muscle and its physiological properties.	1
	Total	4
Cardiovascular system	Heart- structure , course of circulation, rhythmic excitation of heart ,	1
	Conducting system and transmission of impulse, electrical changes accompanying heart and electrocardiogram	1
	" " "	1
	Cardiac cycle, heart sounds , cardiac output , its variation and regulation	1
	Coronary circulation , heart beat and properties of heart pulse	1
	Neural and chemical regulation of heart circulation , hemodynamic of circulation	1
	Blood pressure, venous pressure and arterial pressure neural and chemical control of blood vessels and vasomotor reflexes	1
	Adaptation of circulation during exercise, Shock , its mechanism , Unitarian theory , classification of shock	1
	Fluid and electrolyte balance examination	1
	Total	9
Respiratory system	Respiratory apparatus , Mechanism of respiration , Volume of air respired intrathoracic pressure and pneumothorax	1
	Artificial respiration , Chemistry of respiration , Composition of inspired and expired air, blood gases	1
	Law of solubility of gas, transport of blood gases, oxygen and carbondioxide, exchange of gases in lungs and tissues	1
	Regulation of respiration, atomicity of respiratory centre and physio-chemical regulation of respiratory center	1
	Atomization of respiratory centre and physio-chemical regulation	1

	Respiratory reflexes, adaptation of respiration during muscle exercise, Hypoxia, role of respiration in acid base mechanism	1
	Respiration in birds	1
	Total	7
Blood	General function of blood , blood cells, plasma and serum, anticoagulant	1
	Erythrocytes, number shape , size composition , specific gravity, erythrocytes sedimentation rate , hematocrit and hemolysis	1
	Erythropoiesis and its regulation, life span and fate of R.B.C	1
	Haemoglobin , chemical structure, synthesis , estimation , physiological function , derivatives of haemoglobin and absorption spectra, anemia.	1
	Leucocytes classification, origin, properties , differential count , role of lymphocytes in immunity	1
	Plasma composition, plasma proteins , origin & function , coagulation of blood volume and its determination	1
	Lymph , cerebrospinal fluid & synovial fluid , composition , formation and flow	1
	Total	8
Grand Total		28

Practical

Chapter	Topic	No.of lectures
	Collection of blood samples from various animals and birds, preservation of defibrillated blood	1
	Enumeration of erythrocytes, leukocytes, leukocytes differential count- platelet count	2
	" " "	1
	Estimation of hemoglobin, haematocrit, erythrocyte sedimentation rate, packed cell volume	1
	bleeding time, coagulation time, erythrocyte fragility	1
	blood grouping	1
	Recording of ECG in various animals	1
	Effect of heat and cold (on heart)- effect of drugs (on heart)	1
	Effect of vagus stimuli on heart- vagal escape- all or none law	1
	Measurement of blood pressure and central venous pressure/ atrial pressure	1
	Recording of respiration- spirimetry - vital capacities- PaO ₂ , PvO ₂ , PaCO ₂ , Pv CO ₂ ,	1
	Cardiac output and calculation of related parameters	1
	Total	13

Reference:

- Animal physiology-Arora
- Animal physiology-Kanta
- Physiology of Domestic Animal-Dukes.
- Veterinary Physiology- Cunninghams
- Medical Physiology- Guyton
- A Textbook of Medical Physiology-Anil Baran Singh Mahapatra

FIRST SEMESTER**Course Code-VBC-111****Course title: General Veterinary Biochemistry****Cr.Hrs 2+1=3****Full marks:75****Theory –50****Practical-25****Syllabus with breakdown****Theory**

Topics	No. of lectures
Scope and importance of biochemistry - biochemistry of cellular and subcellular components.	1
Concentration of solutions, diffusion, osmotic pressure, viscosity, absorption, colloidal state of matter, dissociation of acids, pH, buffer systems, membrane equilibrium.	1
" " " " "	1
Biochemistry of carbohydrates, classification, isomerism - optical isomers, Stereo isomers - Alfa and beta anomers, epimers, furanose and pyranose structure – aldose and ketose	1
" " " " "	1
Mutarotation, structure properties & identification of Monnosaccharides: ribose, glucose, fructose, galactose, manose, amino sugars, chemical reactions of monosaccharides: osozone formation, oxidation of aldose, reduction of monosaccharides with mineral acids; with alkalies	1
" " " " "	1
Disaccharides: Structure of maltose, lactose, sucrose; Polysaccharides: starch, glycogen, cellulose; structure of inulin, dextrans, and chitin	1
" " " " "	1
Mucopolysaccharides - biochemical significance of important carbohydrate.	1
Biochemistry of lipids : classification of lipids - simple lipids, compound lipids and derived lipids; composition, structure, properties of lipids	1
" " " " "	1
" " " " "	1
Biochemical significance of phospholipids, fat indices, importance of steroids – identification of fat,	1
" " " " "	1
" " " " "	1
Biochemistry of proteins – classification, structure and properties of simple, conjugated and derived proteins – protein structures	1
" " " " "	1
Properties of proteins, denaturation, amphoteric nature, precipitation and coagulation.	1
- Amino acids; classification and structure, neutral amino acids, basic amino acids, acidic amino acids.	1

"	"	"	"	"	1
Properties of amino acids, amphoteric nature, optical activity, peptide bond formation. Reaction with ninhydrin, 1-fluoro - 2, 4-dinitrobenzene (Sander's reagent). Decarboxylation, salt formation with HCl.					1
"	"	"	"	"	1
Nucleic acid: classification and structure of nucleic acids -purines and pyrimiding bases. Nucleotides and Nucleosides of Purines and Pyrimidines. Structure of DNA. Structure of typical RNA.					1
"	"	"	"	"	1
"	"	"	"	"	1
Total					26

Practical

Topics	No.of lectures
Preparation and standardisation of acids and alkalis	1
"	1
"	1
Determination of osmotic fragility, viscosity	1
Preparation of buffers, calorimetric and electrometric determination of pH	1
"	1
Colorimeter qualitative and quantitative tests and identification of carbohydrates	1
"	1
Saponification value of fat	1
Quantitative tests of Proteins and albumin-	1
Paper chromatography	1
Electrophoresis	1
Colorimetric studies	1
Total	13

Reference

- Ahmand , M . 1995. Modern Biochemistry(Vol I& II).Oxford and IBH Publication , Co, Pvt,Ltd, New Delhi.
- Conn, E.E ., P.K. Stumpf, G .Brueing and H .D. Roy.1987.Outline of Biochemistry.John Wiley and Sons . New work.
- Rameshwar , A. 1993 . Outlines of Plant Biochemistry . Naya Prakash, Calcutta.
- Rameshwar, A .1993 Practical Biochemistry : A basic course Kalyani Publication, New Delhi.
- Well , J. H . 1990 . General Biochemistry . Wiley Eastern Ltd. New Delhi.
- Wilson, K. and J.Walker .1995 Principles and Techniques of Practical Biochemistry Cambridge Universities Press.

FIRST SEMESTER**Course Code- AGB-111****Course title: Biostatistic and Computer application.****Cr.Hrs 2+1=3****Full marks: 75****Theory –50****Practical-25****Syllabus with breakdown****Theory**

Topics	NO of Lectures
Introduction and importance.Observation and data recording	1
Frequency distribution and Normal distribution	2
Statistics parameters – mean, mode median	1
Variance, standard error and coefficient of variation.	1
Probability,	2
Correlation	1
Regression.	1
Test if hypothesis – T.F.S.Z. tests for significance	4
EXPERIMENTAL:- Design C.R.D	1
R.B.D	1
Analysis of variance	1
Programming of Data	1
BIO ASSAY:- Meaning of bio-assay, dosage response curve, meaning of relative potency of drugs	1
LSDO, ed 50, Parallel ratio, mortality rates, fertility rates	1
Incidence and prevalence rate – standardised rates.	1
Total	20
COMPUTER APPLICATION:-	
What is a computer? Components of a computer (anatomy of a P.C.). Types of computers. Hard ware, soft ware, human ware, firm ware	2
Types of memories control unit. Inputs and outputs. Execution of a Program; data types.	1
Constants, variables, expressions, operators, function commands, simple programs, flow charts, storage of data.	2
Filling, retrieving, reproduction, computer languages, their scope and limitation.	1
Database management system. What are computer programs, their scope, limitation, and use of computer for statistical analysis?	2
. Use of computer in Epidemiology; use of computer in farm; use of computer in Veterinary Hospital.	1

Graphics, Geographic Information System. National informatic centre. Libraries on computer disc/floppies.	1
Total	10

Practical

Topics	No.of Lectures
Test of significance T.F.C.Z. tests	3
Estimate of simple corellation.	4
Simple probability questions.	1
Anova formulation	2
DEMONSTRATION:	
Graphics, their use.	1
G.I.S. its use.	1
Use of word precessor	2
Data retrieving and analysis through computer.(Data base).	2
Use of LAN and other net work systems.	1
Retrieving library information through net work	1
Total	19

Reference

1. Gomez, K.A. and Gomez, A.A. (1976). *Statistical procedures for agricultural research with emphasis on rice*. The International Rice Research Institute. Los Banos, Laguna. Philippines.
2. Elhance, D.N. (1979). *Fundamentals of Statistics*. 21st edn. Kitab Mahal. Allahabad. India.
3. Gupta, S.P. (1997). *Statistical Methods*. 28th edn. Sultan Chand & Sons. New Delhi. India.
4. Levin, R.I. and Rubin, D.S. (2000). *Statistics for Management*. 7th edn. Prentice-Hall of India Pvt. Ltd. New Delhi, India.
5. Rangaswamy, R. (2002). *A Text Book of Agricultural Statistics*. New Age International (P) Limited. New Delhi, India.
6. Recide, R.S. (1984). *Elementary Statistics*. 1stedn. Institute of Mathematical Sciences and Physics, UPLB, Laguna, Philippines.

FIRST SEMESTER**Course Code- LPM-111****Course title: General livestock management****Cr.Hrs 1+1=2****Full marks: 50****Theory –25****Practical-25****Syllabus with breakdown****Theory**

Topics	No. of lectures
Introductory animal husbandry, common animals husbandry terms	1
Body conformation and identification	1
Breeds of cattle and buffalo, sheep, goat, horses, pig , poultry	1
“ “ “ “	1
“ “ “ “	1
Common vices in animals, their prevention and care	1
Factors affecting health of livestock, signs of illness and care and management of sick animals	1
Disinfection, isolation, quarantine and disposal of carcasses	1
Dentition and age of animals	1
Rules and regulations regarding transport of livestock by rail, road, air and on foot	1
Care and management of young stock, dry and pregnant animals	1
“ “ “ “	1
Protection against external and internal parasites	1
Total	13
Welfare issues: Introduction to animal welfare, Welfare assessment and five freedoms, behavioral measures of welfare	

Practical

Topics	No. of lectures
Familiarising parts/ points of various animals	1
Approaching and handling of farm animals	1
Tattooing, branding, ear tagging and notching of animals for identification	1
Methods of restraining and casting controlling of animals like horse, cattle, sheep, goat, pigs, cats, dogs, lab animals, poultry and other birds	1
Determination of age of farm animals through dentition and horn rings	1
Methods of washing, grooming, exercise, dipping, spraying, clipping and shearing	1

Weighing of farm animals and birds by measures and by formulae and their correspondence or discrepancy	1
Management of animals during transport by different means	1
Preparation of animals, birds for show, milking dairy animals	1
Training of breeding males	1
First aid, methods of administration of medicines and bandages and bandaging, identification of animals to be done in livestock- poultry farms	1
Recognising various breeds of animals and birds	1
Familiarization of farm routine	1
Total	13

Reference:

- Cattle Management – Cheryl May, Roston Publishing Company, Inc. Roston, Virginia.
- Textbook on Buffalo Production –C.K. Rajhan, N.N.Pathak. Vikas Publishing House Pvt.Ltd, New Delh.

FIRST SEMESTER**Course Code- LPM-112****Course title: Fodder production and grassland management****Cr.Hrs 1+1=2****Full marks:50****Theory –25****Practical-25****Syllabus with breakdown****Theory**

Topics	No. of lectures
Introductin on fodder production	1
Importance of grasslands and fodders in livestock production	1
Agronomical practices for production of leguminous fodders in different seasons	1
“ “ “ “	1
Agronomical practices for production of non-leguminous fodders	1
“ “ “ “	1
Storage of feeds and fodders	1
“ “ “ “	1
scarcity fodders	1
Feed and fodder management for individual animals	1
Fodder production for small units through inter cropping or back yard cultivation	1
Recycling of animal washings and wastes in fodder production	1
“ “ “ “	1
Total	13

Practical

Topics	No. of lectures
Visit to the fodder farm	1
Familiarization with the various types of fodder crops utilised in the state and samples of fodder in Nepal	1
Fodder cropping routines- familiarization	1
" " "	1
Collection and preservation of fodder	1
Cost calculations of fodder production	1
Familiarizations with the back yard fodder croppind and inter cropping of fodder	1
Livestock waste utilisation and recycling	1
Calculation on the economic aspects of fodder cropping in the above situations	1
Feed storage in animal and poultry farms	1

Possible damages/loss and methods to prevent them.	1
Economic aspects of procurement of feeds	1
The recording feeds that are used in small and back yard units and their economics.	1
Total	13

Reference

- Pandey K.K ..1982. Fodder tree and tree fodder in Nepal.Swiss Federal Institute of Forestry research. Birmensdorf , Switerland.
- Relwani.L.L .1979.Fodder crops and grasses. ICAR Publication.
- Cayley, J.W.D.and P.R.Bird 1991. Technique for measuring pasture. Technical report series No.191 Hamilton, New Zealand.
- Bayer, W.and A.W.Bayer. 1998. Tropical Agriculture forage Husbandry.ICAR, Macmillan.
- Pande R.S.1997. Fodder and pasture development in Nepal. Udaya R.D.Service (P). Ltd, Kathmandu, Nepal.
- Pathak N.N. and R.C. Jakhmola. 1983. Forage and livestock production. Bikash publishing house, New Delhi.
- Stevens. J.E.1991. Fodder and pasture seed program. Consultant report. HMG, Nepal. DOAD, Livestock Development Project, Nepal.

FIRST SEMESTER**Course Code- AHE-111****Course title: Sociology and principles of veterinary and animal husbandary****Cr. Hrs: 2+1=3****Full marks:75****Theory –50****Practical-25****Syllabus with breakdown****Theory**

Topics	No.of lectures
Definition of sociology, significance of the study of rural sociology and urban sociology for extension worker	1
Primary concept of sociology, (Society, community, association, institution, rural institution)	1
Difference between rural, tribal and urban communities, social change, factors of change, caste and adoption of non-traditional caste occupation on Indian villages social groups, its types and functions for undertaking development program.	1
The social transformation under urban society in respect of these said factors.	1
Definition, philosophy and principles of extension education, steps of extension teaching.	1
Community development, aims, objectives, organisational set-up	1
Role of animal in the economy, health and socio-psychology of rural, semi urban and urban society (role of farm stock, companion animals, sports animals)	1
Animal rearing patterns in rural and urban public for data collection, history taken, follow up	1
Client dealing	1
Communication with rural and urban public for data collection, history taken, follow up	1
Appraisal on prognosis, announcing death of animal to the owner etc.	1
Extension education: education and its approaches, meaning, concept and types of education and its objectives in national context	1
Formal, nonformal and informal education. Role of nonformal education in rural development	1
Extension education – definition, concepts, history, philosophy and principles of extension education; objectives of extension education; basis approaches	1
Extension delivery system and its components	1
Basis learning principles and adult learning – meaning of teaching and learning	1
Concepts and laws of learning; basic learning theories and learning processes	1
Principles of adult learning and learners' characteristics: participatory and experimental learning	1
Factors affecting adult learning: Elements of effective teaching	1
Rural leadership development: Meaning, types of leaders and leadership	1
Role of local leader in extension education	1
Characteristics of a good leader	1
Methods in identifying leaders: Selection and development of local leaders	1
Livestock extension in Nepal: Historical background and present organization. Approaches of extension delivery system in Nepal	1
Extension teaching methods; individual methods, group methods, mass media methods	1

Communication: concept, definitions and meanings, elements, importance and scope/ role of communication in extension work.	1
Functions of communication: communication models, communication channels	1
Types of communication, feedback in communication, organizational communication in livestock development	1
Communicator – communicate relationship; problems in communication	1
Interpersonal communication and mass media in developing societies	1
Audio-visual aids and other teaching aids	1
Total	31

Practical

Topics	No. of lectures
Social survey, its kinds, social sampling, using various types and tools of data collection; data analysis.	1
Motivating individuals to divulge data.	1
Assessing the livestock man relation, sentiments, fads etc.	1
Identification of key communicators, operating through them/volunteers in society	1
Methods of working through functional leaders.	1
Identifying social taboos, social differences, and irritants in the way of organising programs	2
Identifying right man for right jobs, organising their cohesion, ironing out their differences, motivating individual for a program.	1
Visit to different livestock organizations FLDP, SLDP, TLDP, CLDP to study their organization patterns, working procedures, program development and implementation, goals, achievements and linkages	2
Identification of group processes and use of group approach currently in use at different livestock centers	1
Study of extension teaching methods used by the district livestock development officers and NGOs	1
Communication: identifying individual, group and mass media being used in communicating development messages	1
Designing and preparation of audio-visual materials such as poster, booklets, leaflets, folder, slide series etc.	2
Total	15

Reference

- Textbook of extension education. B.B.Sing Dangol & N.N. Joshi
- Sociology, B.Bhushand
- Principles of Ecomonic. P.Chopra

SECOND SEMESTER**Course code- VAN-122****Course title- GROSS ANATOMY - II(Neurology, Angiology and Aesthesiology)****Credit hrs-2+1****Full marks :75****Theory:50****Practical:25****Syllabus with breakdown****Theory**

Major Field	Topics	No. Of Lecture
Neurology	Introduction of neurology (cattle)	1
	Gross study of Meninges	1
	Gross study of brain & Spinal cord	1
	Gross study of Cranial & Spinal nerves	1
	Gross study of Brain, spinal cord, cranial& spinal nerves	1
	Autonomic nervous system of ox & Buffalo	1
	Comparison of above feature with other species (goat, sheep, horse, dog, pig & Poultry)	1
	Ist Internal Assessment (11:00-13:00)	
	Comparison of above feature with other species (goat, sheep, horse, dog, pig & Poultry)	1
	Functional importance of nerves from clinical and production point	1
	Total:	9
Aesthesiology	Gross study of Eye (cattle) Different parts of Eye	2
	Structural Of Eye and their normal appearance and functional importance	1
	Comparison of the above features in other species (sheep , horse , dog , goat, pig & poultry)	1
	Gross study of Ear (cattle)	1
	Different Parts of Ear	1
	Structure Of Ear and their normal appearance and functional importance Comparison of the above features in other species (Sheep , Goat , Horse , Dog, Pig & Poultry)	2
	Total:	8
Angiology	Introduction of Angiology	1
	Gross study of Heart	1
	Study Of Heart conduction system & their Vessels	1
	Iind Internal Assessment (11:00-13:00)	
	Comparison of the above features from clinical and production point of view in Goat ,Sheep , Pig , Horse , Dog& Fowl	1

	Comparison of the above features from clinical and production point of view in Goat ,Sheep , Pig , Horse , Dog& Fowl	2
	Total:	6
	Grand Total:	23

Practical

Major Field	Practical Topics	No. of Lecture
Neurology	Observation of cattle Brain	1
	Study of Brain Parts	1
	Study of Spinal cord	1
	Study of spinal cords & its branching	1
	Study of motor nerve trunks, autonomic & peripheral nerves of Ox/Buffaloes	1
	Comparison of above features with other species & their clinical importance	1
	Total:	6
Aesthesiology	Study of the Eye of cattle/ Buffalo.	1
	Study the structure of the Eye ball	1
	Study of the Ear of cattle/ Buffalo	1
	Comparison of its shape, structure and their functional importance of other species (sheep, goat, horse, dog, horse, pigs, poultry)	1
	Total:	5
Angiology	Study of heart, its structures, conduction system	1
	Dissection of great vessels, afferent & efferent blood vessels	1
	Lymphs channels, Lymphoids, their drainage	1
	Comparison of Cardiovascular system of various sps & their functional importance	1
	"	1
	Total:	5
	Grand Total:	16

Reference

- Anatomy of ox –ICAR publication
- Anatomy of Farm animal-Fradson, R.D.
- Anatomy of Domestic Animal-Sisson and Grossman
- Primary Veterinay Anatomy-R.K. Ghosh and A.K. Ghosh.
- Tropographical anatomy of domestic animals, Atlas by Peter Popesco.
- Text book of Veterinary anatomy by Dyce.

- The systemic study of canine anatomy by D.R.Adams.
- Miller's Guide to the dissection of the dog by H.E.Evans.

SECOND SEMESTER

Course code- VPY-122

Course title- VETERINARY PHYSIOLOGY-II(Digestive, Excretory and Nervous System)

Credit hrs-2+1

Full marks :75

Theory:50

Practical:25

Syllabus with breakdown

Theory

Major Field	Topics		
Digestive System	Functional anatomy of digestive tract of manogastric animal	1	
	Ruminant/animals, prehension, mastication, deglutition	1	
	Movements of stomach, small intestines and large intestine, ruminants of defecation, hunger, contractions	1	
	Thirst, vomition, saliva, its composition, secretion and function	1	
	Pancreatic juice, bile, intestinal, juices their regulation, composition & function	1	
	"	1	
	Digestion in the ruminant stomach, microbial activities in the stomach and intestine.	1	
	Internal Assessment (11:00-13:00)		
	Absorption of foodstuffs, places of absorption, mechanism of absorption	1	
	Absorption of carbohydrates, proteins, fats and water	1	
Digestion in Poultry	1		
	Total:	10	
Urinary System	Kidneys: Structure of nephron, Histological peculiarities, blood supply of kidney	1	
	Methods of studying renal function	1	
	Mechanism of urine formation, micturition	1	
	Physical characteristics and composition of urine in healthy and diseases condition	1	
	Role of kidneys in acid base and electrolyte balance	1	
	Excretion of urine in birds	1	
Nervous System	Structure of nerve fibre, degeneration and regeneration of nerve fibres	1	
	Nature of the nerve impulse and its propagation	1	
	All or none character of nerve impulse	1	
	Transmission of excitatory state from nerve to effect on nerve tissue	1	
	Nervous system, neurons, synapse and transmission of nerve impulse	1	
	Cutaneous receptor organs, peripheral nerves	1	
	Spinal cord & reflex action	1	
	Brain stem & Cerebellum, cerebral hemisphere, conditioned reflexes, wakefulness and sleep	1	
Autonomic nervous system, general arrangement and chemical transmission	1		

	Total:	9
Sensory organs	Eye: Structure of eyes, nourishment & protection, mechanism of vision, visual accommodation and defective vision	1
	Retina & its structure physiological and structural changes in retina on exposure to light	1
	Ear: Structure & mechanism of hearing, physiology of olfaction and taste	1
	Skin: function, sebaceous and sweat glands and their functions	1
	Thermos regulation, maintenance of body temperature, regulation against heating and cooling	1
	Total:	5

Practical

Major field	Topics	No. of Lecture
Digestive System	Counting of rumen motility	1
	Estimation of volatile fatty acids & ammonia in rumen	1x
	Bacterial count- protozoal count	1
	In vitro action of proteolytic enzymes-pepsin & trypsin	1
	Recording of rumen movements-reticular sounds	1
	Intestinal motility	1x
	Total:	6
Urinary System	Physiological constituents of urine	1
	Estimation of titrable acidity in urine	1
	Demonstration of kidney function tests & urine secretion	1*
	Excretory system of birds	1
	Total:	4
	Kind Internal Assessment (11:00-13:00)	
Nervous System	Nerve muscle preparation	1x
	Simple muscle curve in vivo	1x
	Muscle stimulation-effect of cold, heat & load effect of fatigue	1x
	Total:	4

Reference

- Animal physiology-Arora
- Animal physiology-Kanta
- Physiology of Domestic Animal-Dukes
- Veterinary Physiology- Cunningham
- Medical Physiology- Guytons

SECOND SEMESTER**Course code- VAN-123****Course title- GROSS ANATOMY - III (Splanchnology)****Credit hrs-1+1****Full marks :50****Theory:25****Practical:25****Syllabus with breakdown****Theory**

Topics	No. of Lecture
Introduction of Splanchnology	1
Gross Study of the Digestive Organs of cattle	1
"	1
Gross Study of Respiratory Organs of cattle	1
"	1
Gross Study of Urinary Organs of Cattle	1
Ist Internal Assessment/ 14:30-16:30 pm	
Gross Study of Urinary Organs of Cattle	1
Gross Study of Reproductive Organs of Cattle	1
Endocrine system of Cattle	1
Comparison with other species (goat, sheep, pig, horse, dog & poultry) Especially, the difference of salient structure & functional features	1
Comparison with other species (goat, sheep, pig, horse, dog & poultry) Especially, the difference of salient structure & functional features	1
	13

Practical

Topic	Lecture No.
Gross study of tongue of ox and other domestic animal.	1
Gross study of teeth, Palate and muzzle of ox and other domestic animal.	1
Gross study of oesophagus, pharynx of ox and other domestic animal.	1
Gross study of Rumen, reticulum, omasum and Abomasum of ox and other domestic ruminant animals.	1
Gross study of stomach of horse, pig and dog.	1
Gross study of Intestine, Pancreas and liver of ox and other domestic animal.	1
Study of digestive system of poultry.	1

Gross study of respiratory organs; Nasal cavity, Larynx and Trachea.	1
Gross study of lung of ox and other domestic animals.	1
Gross study urinary organs; Kidney, ureters, urethra and urinary Bladder of ox and other domestic animals.	1
Gross study of male reproductive organs of Bull and other domestic animals.	1
Gross study of female reproductive organs of cow and other domestic animals.	1
Gross study of endocrine system of ox	1
Gross study of Spleen of ox and other domestic animals.	1
Topographic comparison in live animals.	1
Gross study of respiratory , Uro-genital system of poultry.	1
Total	16

Reference

- Anatomy of ox –ICAR publication
- Anatomy of Farm animal-Fradson, R.D.
- Anatomy of Domestic Animal-Sisson and Grossman
- Primary Veterinay Anatomy-R.K. Ghosh and A.K. Ghosh.
- Textbook of Veterinary anatomy by Dyce.
- The systemic study of canine anatomy by D.R.Adams.
- Miller“s Guide to the dissection of the dog by H.E.Evans
- Topographical anatomy of domestic animals, Atlas by Peter Popesco.

SECOND SEMESTER**Course code- VBC-122****Course title- PHYSIOLOGY CHEMISTRY(Animal Metabolism, Systemic Functions and Enzymes****Credit hrs-2+1****Full marks :75****Theory:50****Practical:25****Syllabus with breakdown****Theory**

	Topics	Lecture
Study of physio-chemical laws	Study of osmosis, diffusion, colloidal state	1
	Donnan's theory of membrane equilibrium	1
Enzyme	Definition, and unit of enzyme. Properties: - Protein nature, enzyme substrate complex formation, modern concept about the active centre of enzyme.	1
	Specificity of enzyme action: group specificity, stereospecificity, optical specificity. Coenzyme and cofactors	1
	Effect of substrate concentration, effect of enzyme concentration. Effect of pH, effect of temperature on enzyme action.	1
	Competitive and non-competitive inhibition of enzyme. Classification of Enzyme.	1
Biological oxidation	Enzymes and coenzymes involved in oxidation and reduction: - Oxidoreductase; oxidizes, aerobic dehydrogenase, hydroperoxidase, anaerobic dehydrogenase, cytochromes.	2
	Mitochondrial electron transport chain	1
Metabolism in ruminants and non-ruminants:-	(i) Carbohydrate metabolism: (a) Glycolysis.	1
	(b) T.C.A. Cycle.	1
	(ii) Fat metabolism: (a) β -Oxidation of fatty acid, ketone body formation.	1
	(iii) Protein metabolism: (a) Deamination & Transamination. (b) Urea synthesis.	1
	(c) Protein synthesis.	1
	Ist Internal Assessment. (14:30-16:30)	
	(iv) Nucleic acid metabolism: (a) DNA synthesis	1
Energy metabolism in domestic animals:-	(i) Caloric value of foods, R.Q., S.D.A., (ii) Basal metabolism.	1
Metabolism of minerals:	(i) Metabolism of calcium & phosphorus etc.	1
	(ii) Metabolism of essential trace elements (a).Iron (b).Cobalt and selenium.	1
	Use of Isotope in metabolic studies.	1
Vitamins: Structure and metabolic role:-	(i) Vitamin A, D, E, & K. (ii) Vitamin C.	2

	(iii) Role of Vitamin B-complex as coenzyme only: - Thiamine, Riboflavin, Niacine, Pantothenic acid, Lipoid acid, Biotin, Folic acid, Vitamin B 12.	2
Biochemistry of blood and other body fluids	(i) Plasma proteins and functions of plasma proteins.	1
	(ii) Plasma protein changes in disease some inherited deficiency of plasma protein fractions	1
	(iii) Hemoglobin chemistry. (iv) Coagulation and haemolysis of blood.	1
	(v) Lymph, tissue fluid and C.S.F. (vi) Chemistry of Bile.	1
	Biochemistry of tissue (only brief notes).	1
	Second Internal Assessment	
	Total	28

Practical

Topics	Lecture
Biochemical Estimation of Plasma proteins.	2
Urine analysis.	2
Estimation of blood sugar.	2
Ist Internal Assessment (14:30-16:30)	
Estimation of Serum total cholesterol.	2
Serum Billirubin determination.	2
Blood urea estimation.	1
IInd Internal Assessment	
Blood urea estimation.	1
Glucose tolerance test.	2x
Total:	14

Reference

- Anatomy of ox –ICAR publication
- Anatomy of Farm animal-Fradson, R.D.
- Anatomy of Domestic Animal-Sisson and Grossman
- Primary Veterinay Anatomy-R.K. Ghosh and A.K. Ghosh.
- Textbook of Veterinary anatomy by Dyce.
- The systemic study of canine anatomy by D.R.Adams.
- Miller's Guide to the dissection of the dog by H.E.Evans
- Topographical anatomy of domestic animals, Atlas by Peter Popesco.

SECOND SEMESTER**Course code- VBC-123****Course title- INTRODUCTION TO MOLECULAR BIOLOGY AND BIOTECHNOLOGY****Credit hrs-1+1****Full marks :50****Theory:25****Practical:25****Syllabus with breakdown****Theory**

Major Field	Topics	No. of Lectu
Molecular Biology	History of Molecular Biology. Definition, Origin & History, Fields of Mo Application	1
	Molecules in cell	1
	Basic Principles of biosynthesis of proteins & nucleic acids	2
	Deoxyribonucleic acid & ribonucleic acid	1
	Genomes, Gene-sequencing	1
	Polymerase Chain Reaction	1
Bio-Technology	Basic principles of biotechnology applicable to Veterinary science eg.	1
	I- Reproduction, (A) Embryo TransfersTechnology,	1
	(B) In vitro Fertilizations, (C) Pregnancy diagnosis and (D) Transgenic animal	1
	II-Disease diagnosis: (H) Hybridoma Techniques, Monoclonal (I) DNA probes, (J) Prophylaxis subunit vaccines	2
	A) Western blot, Southern blot	1
	B) Animal Cell culture and cell lines	1
	Total:	14

Practical

Topics	No. of Lectures
Isolation and culturing of lymphocytes	1
Chromosomal preparation and staining	1
Embryo Transfer Technique - Super ovulation, Collection, Screening of embryo	1
Embryo Transfer Technique - Super ovulation, Collection, Screening of embryo	1
Ist Internal Assessment	

Isolation of DNA and RNA	1
Cell culture technique and cell lines.	1
Cell culture technique and cell lines.	1
Demonstration through Models/charts of Molecular Biology Aspects	1
Demonstration through Models/Charts of Molecular Biology Aspects	1
Internal Assessment (11:00- 13:00)	
Use of Audio visual technology (slide, video tapes, film, floppies, etc.) for applied asp biotechnology (with respect to Livestock Health, Production and technology	1
	1
Total	13

Reference

- Principle of Biochemistry: Lehninger, Nelson, Cox , CBS Publications , 1993.
- Molecular Cell Biology: Darnell, Lodish and Baltimore:1986 by Scientific American Books.
- Textbook of Biochemistry with Clinical correlations: Thomas M.Delvin; A John Wiley and Sons, Inc. Publications.
- Textbooks of Chemotherapy: Gunter Zweig Joseph Sherma.Editors-in –chief: General Data and Principle VolumnII, RCR Press, Inc.Boca Raton, Florida; 1982.

SECOND SEMESTER

Course code- AGB-122

Course title- PRINCIPLES OF GENETICS AND POPULATION GENETICS

Credit hrs-2+1

Full marks :75

Theory:50

Practical:25

Syllabus with breakdown**Theory:**

Topics	No.of Lecture
Genetics, History of Genetics	1
Study of animal cells	1
Chromosomes, types of chromosomes, No of chromosomes in different sps	1
Mitosis	1
Meiosis	1
Mendelian Principles	1
Dihybrid and polyhybridation	1
Gene interaction, epistasis, multiple alleles	1
Linkage and crossing over	1
Sex-controlled inheritance and sex determination	1
Modified Mendelian inheritance-lethal and sub lethal characters	1
Mutation, chromosomal aberration	1
Cytoplasmic inheritance	1
Preliminary ideas of biochemical: bacterial developmental genetics	1
Ist Internal Assessment (14:30-16:30)	
Quantitative inheritance	1
Genetics constitution of population-gene frequency, genotype frequency	1
Hardy Weinberg law	1
Effects of selection, migration on gene frequency	1
Mutation and population size on gene frequency	1
Value and Means-Population mean	1
Dominance deviation and interaction deviation	1
Variance-genetic and environmental variance	1
Resemblance and phenotypic resemblance	1
Heritability	1
Heritability	1
Revision	1
Iind Internal Assessment (14:30-16:30)	
Total:	26

PRACTICAL

Topics	No. of Lecture
Study of cytological slides of animal tissues with special reference to mitosis	1
Study of cytological slides of animal tissues with special reference to meiosis	1
Problems of monohybrids inheritance + dihybrid inheritance	1
Gene interaction, multiple alleles	1
Linkage and crossing over	1
Sex-linked inheritance. Lethal factors	1
Ist Internal Assessment (14:30-16:30)	
Computation of gene and genotypic frequency	1
Calculation of effects of selection	1
Migration, mutation and population size on gene frequency	1
Calculation of population mean, average effect, breeding value	1
Dominance deviation, interaction deviation	1
Computation of genetic and environmental variance	1
IInd Inteternal Assessment (14:30-16:30)	
Covariance computation of haritability	1
Total:	13

Reference

1. Mukherjee, D.P. and Banerjee, G.C.Genetics and Breeding of farm animals. Oxford and IBH Publishing Co. Pvt Ltd Delhi, India.
2. Rastogi, V.B.(2001).Genetics .Kedar Nath Ram Nath.Delhi , India.
3. Stansfield, W.W.Theory and problems of Genetics.Schaum"s Outline Series.Tata McGraw Hill Publishing Co.Ltd.,New Delhi, India.
4. Strickberger, M.W. (2001). Genetics.Third edition. Prentice-Hall of India Pvt. Ltd., New Delhi, India.
5. Winchester, A.M.(1996).Genetics .Third edition.Oxford & Publishing Co.Pvt.Ltd, New Delhi, India.

SECOND SEMESTER

Course code- LPM-123

Course title- ANIMAL HOUSING AND SANITATION

Credit hrs-1+1

Full marks :50

Theory:25

Practical:25

Syllabus with breakdownTheory

Major Field	Topic	Lecture No.
Water	Important of water, Major functions, Source of water, Animal diseases associated with water supplies, Quality of water.	1
	Requirement of water in various species of livestock, Water pollution, Types of water	1
	Purification of Water – Natural (Storage, Oxidation or Settlement), Artificial (Physical - Distillation, Boiling; Chemical	1
	Precipitation, Disinfection or Sterilization; and Filtration – Slow Sand Filtration and Rapid Mechanical Filtration),	1
	Distribution and Storage of Water Supplies, Action of Water on Metals	
Sanitation	Drainage, General Principles of Sewage Disposal	1
	Ist Internal Assessment	
	Collection, removal and disposal of refuse incineration, dumping, compost making, sorting, collection, storage and disposal of liquid manure	1
Environment	Ventilation –Amount of Fresh Air Required for Ventilation	
	System of Ventilation – Natural and Artificial Ventilation	1
	Different Systems of Natural Ventilation Different Systems of Artificial Ventilation	1
	Light-Germicidal affect of Light, Photoperiodic Mechanism on Reproduction, Coat Colour Change and Falling of Leaves.	1
	Selection of Sites, The Buildings, Building Materials,	1
Housing	Conventional Dairy Barn, Dairy Cowsheds	1
	IInd Internal Assessment (14:30-16:30)	
	Total:	13

Practical

Topics	Practical Class
Familiarization with the various types of Animal houses, pens and cages for avian	1
Various types of animal houses, pens and cages for avian	1
Cost estimation of housing of animals	1
Cost estimation of Housing of birds	1
Cost Effective Animal Houses	1
Cost Effective of avian pens	1
Ist Internal Assessment (14:30-16:30)	
Different system of ventilation	1
Different System of Drainage and sewerage disposal techniques	1
Waste Diversion for liquid Manure Compost	1
Cow Dung Gas Unit etc.	1
Cost Estimation of Cost effective methods-low cost	1
Familiarization with rural and urban animal housing systems- their construction	1
Iind Internal Assessment (14:30-16:30)	
Cost Estimation and Assessment of Efficiency	1
Total:	13

Reference

- Cattle Management – Cheryl May, Roston Publishing Company, Inc.Roston, Virginia .
- Textbook on Buffalo Production –C.K. Rajhan, N.N.Pathak.Vikas Publishing House Pvt.Ltd., New Delh

SECOND SEMESTER**Course code- AHE-122****Course title- LIVESTOCK ECONOMICS, MARKETING AND BUSINESS MANAGEMENT****Credit hrs-2+1****Full marks :75****Theory:50****Practical:25****Syllabus with breakdown****Theory**

Major Field	Topics	No. of Lectures
Economics	Introduction, definition and scope of economics	1
	Wants, goods, wealth, utility, value, price	1
	Real income, money income, Consumption, Demand and Supply	1
	Theory of demand, theory of production, price determination	1
	Important features of land, labour, capital and organization	1
	Production, exchange, distribution and statistics of animals and poultry to State and Nation	1
	Accounting - Definition, objectives common terms used, different system of book keeping	1
	Double entry book keeping, definition, application and its division	1
	Original record, closing of amounts, rules for debit and credit	1
	Recording of business transition. Analysis of financial amounts	2
Product Management	Principles of Product optimization (Timing, Production season etc.)	3
	Production cost and Break even Analysis	1
	Ist Internal Assessment (14:30-16:30)	
Management (Resource Management)	Source and Procurement of materials, financial resources	1
	Resource scheduling under limited resource and capacity problems, procedures of norms fixation	1
Personal (labour) management	Identification of work, work analysis, Distribution of Labour	1
	Optimization of Labour input, Tenants of labour supervision	1
	Department - alienation of economic efficiency, division of labour, merits & demerits of job specialization	2
Marketing	Concept of marketing, needs for marketing, marketing of perishable and non- perishable goods	1

	Merchandising-product planning and development, standardization, grading, buying, selling, transport and storage	1
	Risk bearing, market information, market intelligence,	1
	Market opportunities, consumer behaviour	1
	Consumer demand, market demand, market stagnation, market measurement and forecasting	1
	IInd Internal Assessment (14:30-16:30)	
	Total:	26

Practical

Topics	No. of Lectures
Book keeping, General Entry, Writing of cash book (two column & Three column	1
Ledger, purchase/ sale registers Purchase/ sale return register	1
Trading, profit/loss accounts, Income & Expenditure accounts	1
Balance sheet: Bill of exchange (Bill receivable and bill of payable)	1
Bank accounts, bank reconciliation statement	1
Analysis of inputs & Outputs data in farming	1
Ist Internal Assessment	
Cost accounting practices, project estimation trials	1
Type of errors; ratification of errors	1
Working out of feasibility report	1
Working out of economics of dairy unit of varying sizes	1
Working out of economics of poultry, piggery, sheep and goat units of varying sizes	1
Field visit to farms	1
IInd Internal Assessment (14:30-16:30)	
Visit to livestock farm, livestock market	1
Case analysis on farm/ market and preparation of report	1
Total:	14

Reference

- Johl and Kapoor, Farm management.
- S.S. Gupta, Principle of Economic.
- Slowman, Ecomonic.
- Lepsy, Principle of Economics.

THIRD SEMESTER**Course title: HISTOLOGY AND EMBRYOLOGY (General and Systemic)****Course code: VAN-214****Cr.hrs: 2+2=4****Full marks: 100****Theory: 50****Practical: 50****Syllabus with breakdown****Theory**

Major field	Topics	No. of lectures
General Histology	Introduction to histology: histological terms, historical perspective, tissue sections in different planes	1
	Structure of the cell: compartmentalization, cell wall, protoplasm, cytoplasm, nucleus and other cell organelles etc.	1
	Cell division: cell cycle, mitosis, meiosis	1
	Study of basic tissues of the body- epithelial: type, distribution, function; connective tissue: type, resident cell population of connective tissue, distribution, function; muscular tissue: smooth, skeletal, cardiac muscle, relaxation/contraction, morphology;	1
	Study of basic tissues of the body- nervous tissue: neuron, axon, dendrite, neuroglia, nerve cells etc; supportive tissue: bone and cartilage, structure, osteogenesis, ossification, basic cells of osseous tissues, chondrocytes and chondroblast cells; blood and blood cells: blood, a special connective tissue, red blood cells, white blood cells, platelets, avian blood cell	1
	Total	5
Systemic Histology	Histology of organs of digestive system Buccal cavity, lip, cheek, hard palate, soft palate, tongue, salivary glands in different animals, pharynx, oesophagus, glandular stomach, rumen, reticulum, omasum, small intestine: duodenum, jejunum, ileum, large intestine: caecum, colon, rectum; peritoneum Avian digestive system: Proventriculus, gizzard, lower digestive tract, liver, gall bladder, pancreas, blood, lymph and nerve relationship	1
	Histology of organs of respiratory system: Nasal cavity, nasopharynx, trachea, bronchi, lungs of animals. Avian respiratory system, blood, lymph and nerve relationship	1
	Histology of organs of urinary system: Kidney, uriniferous tubules, juxtaglomerular complex, ureters, urinary bladder, blood, lymph and nerve relationship	1

	Histology of organ of reproductive system:	
	Histology of organs of male reproductive system: testes and associated structures, ductus efferens, ductus deferens, ductus epididymis, accessory glands, ampullary gland, vesicular gland, prostate gland, bulbourethral gland, urethra, penis etc. Blood, lymph and nerve relationship	1
	Histology of organs of female reproductive system: ovary, uterine tubes, uterus, vagina, vulva	1
	Histology of organs of cardiovascular system: Mural organization, artery, arteriole, vein, venule, capillaries, heart, blood, lymph, and nerve relationship	1
	Study of organs of nervous system: meninges, choroids plexus, spinal cord, brain stem, cerebellum, cerebrum, autonomic nervous system, adrenal gland, blood, lymph and nerve relationship	1
	Histology of sense organs: skin, eye, ear etc.	1
	Histology of lymphoid organs: Classification of lymphoid tissues, tonsil, lymph nodes, spleen, thymus, bursa of fabricius, blood, lymph and nerve relationship	1
	Histology of endocrine glands: pituitary gland, pineal gland, thyroid gland, pancreas, blood, lymph and nerve relationship	1
	Total	10
General Embryology	Introduction of Embryology	1
	Description of gametogenesis and fertilization	1
	Description of cleavage and gastrulation	1
	Development of foetal membranes in birds and mammals	1
	Placental and placenta in mammals	1
	Total	5
Systemic Embryology	An over view of development of the digestive organs	1
	An over view of development of the respiratory organs	1
	An over view of development of the urogenital organs	1
	An over view of development of the cardiovascular organs	1
	An over view of development of the nervous and locomotory system	1
	An over view of development of the special sense and endocrine organs	1
	Stage wise study of embryo/foetus of cattle/buffalo	1
	Stage wise study of embryo/foetus of sheep, goat	1
	Stage wise study of embryo/foetus of chick and dog	1
	Total	9
	Grand Total	29

Practical

Major topic	Minor topics	No. of lectures
	Study of compound microscope and its parts	1
	Histological techniques	1
	Study of different basic tissues of the body	1
	Comparative study of digestive system of buffalo, pig, dog and fowl	1
	" " " "	1
	" " " "	1
	Comparative study of respiratory system of buffalo, pig, dog and fowl	1
	" " " "	1
	Comparative study of circulatory system of buffalo, pig, dog and fowl	1
	Comparative study of urogenital system of buffalo, pig, dog and fowl	1
	" " " "	1
	Comparative study of integumentary system of buffalo pig, dog and fowl	1
	Nervous system of buffalo, pig, dog and fowl (central nervous system)	1
	Peripheral nervous system of buffalo, pig, dog and fowl (central nervous system)	1
	Study of reproductive system of buffalo, pig, dog and fowl	1
	Study of lymphatic system of buffalo, pig, dog and fowl	1
	Study of eye of buffalo, pig, dog and fowl	1
	Study of different parts of egg of fowl	1
	Microscopical study of sperm of buffalo, pig, dog and fowl	1
	Microscopical study of ova of cow and buffalo	1
	Study of the serial section of chick embryo and pig embryo at different stages of development	1
	Study of serial sections of foetus of chick and pig	1
	Study of foeti of various species at various stages of pregnancy	1
	" " " "	1
	Comparative study of foetii of various spp. at various stages of pregnancy	1
	" " " "	1
	Total	26

Reference

- Veterinary Histology-Horst Dieter Dellmann.
- Textbook of Veterinary Histology-Dellmann and Brown.
- Embryology of Pig-Bradley M. Pattern.
- Outline Text, Histology and Embryology-Robert Getty.
- A Textbook of Embryology –G.S. Sandhu, Sharad Srivastava, C.K. Arrora.
- Handbook of Histology and Histochemical techniques-S.K. David.
- Bailey's Textbook of Histology.

THIRD SEMESTER

Course title: VETERINARY PHYSIOLOGY III (Endocrinology Reproduction and Lactation)

Course code: VPY-213

Cr.hrs: 2+1=3

Full marks: 75

Theory:50

Practical:25

Syllabus with breakdown

Theory

Major field	Topics	No.of lectures
Endocrinology	General organisation and methods of study of endocrine system; definition and classification, general mode of action and regulation of hormones. Physiology of hormones.	1
	Gonadotrophic hormones of anterior pituitary glands; follicular stimulating hormone, leutinizing hormone and prolactin.	1
	Hypothalamus and hypophysis and their relationship to target glands and organs.	1
	Endocrine physiology of Thyroid, Parathyroid	1
	Endocrine physiology of Adrenals, Pancreas, Pineal body, Thymus.	1
	Hormones of gastrointestinal tract. Prostaglandins.	1
	Total	6
Reproduction		
Female genital system	Functions of ovary structure of graffin follicles and corpus luteum	1
	Ovarian hormones: Estrogen and Progesterone and their actions.	1
	Oestrus cycle and their regulations	1
	Changes in the female genital organs during the various phases of the sexual cycle and their regulation.	1
	" " " "	1
	Ovulation and fertilisation; pregnancy.	1
	Functions of placenta	1
	Hormones present in the biological fluids during pregnancy and their use for the diagnosis of pregnancy	1
	Control of estrous cycle	1
Male genital system	Functional anatomy of testes and accessory genital glands.	1
	Spermatogenesis	1
	Hormonal control on spermatogenesis	1

	Testosterone, its functions and regulation	1
	Cryptorchidism.	1
	Total	14
Lactation	Functional organisation of mammary glands, structure and development	1
	Effect of estrogen and progesterone, hormonal control of mammary growth	1
	Lactogenesis and galactopoiesis	1
	Composition of milk.	1
	Total	4
	Grand Total	24

Practical

Major field	Topics	No. of lectures
	Sperm concentration and sperm motility	1
	Live and dead sperm count.	1
	Characteristics of oocytes	1
	Demonstration of oestrus cycle in different species	1
	Demonstration of parturition in various animals (live or video films)	1
	Effect of heat and cold on scrotal musculature	1
	Phenomenon of mating	1
	Egg laying	1
	Demonstration of factors affecting 'let down of milk'	1
	Estimation of progesterone and oestrogen by ELISA technique	1
	Estimation of progesterone and oestrogen by RIA technique	1
	Total	11

Reference:

- Animal physiology-Arora
- Animal physiology-Kanta
- Physiology of Domestic Animal-Dukes
- Veterinary Physiology- Cunninghams
- Medical Physiology- Guytons
- NMS Physiology

THIRD SEMESTER**Course title: PRINCIPLES OF ANIMAL NUTRITION****Course code: ANU-211****Cr.hrs: 2+1=3****Full marks: 75****Theory:50****Practical:25****Syllabus with breakdown****Theory**

Major topic	Minor topics	No.of lectures
	History of Animal Nutrition, its importance in animal health and production.	1
	Classification of food body nutrients and composition of animal body, plants and composition of nutrients in various livestock products.	1
	comparison between plants and animals,	1
	Biochemical basis of soil nutrients in relation to plant growth and animals production	1
	Some important nutritional terms and their definitions.	1
	Nutrients and their metabolism, in plant and animal body	1
	Role and requirements (water, carbohydrates, their digestion, absorption and metabolism) in ruminants	1
	Role and requirements of nutrients in non-ruminants.	1
	Digestion and absorption of food nutrients in Non-Ruminants	1
	Digestion, breakdown and absorption of food nutrients in Ruminants	1
	Proteins and amino acids, their digestion, absorption and metabolism.	1
	Use of NPN compounds in ruminants and non-ruminants.	1
	Metabolism of carbohydrates in ruminants and non-ruminants	1
	Metabolism of protein and amino acid in ruminants and non-ruminants	1
	Lipids nutrition and metabolism in farm animals.	1
	Synthesis of fats (lipids) and their breakdown/degradation for energy.	1
	Carbohydrate (glucose) as a major source of energy and its metabolic patheneup in animal body.	1
	Protein/amino acid synthesis and its utilization in animal body	1
	Minerals and their classification and function in animal body	1
	Role of major/macro elements in animal metabolism and production	1
	Importance of various trace elements in the physiology. Health and production performance of animals	1
	Mineral deficiencies & toxicity in farm animals.	1
	Importance of vitamins in animal production and their classification	1
	Potency and deficiency of vitamins in farm animals.	1
	Role of various nutrients in the ration of livestock and poultry	1
	Role of feed supplements and feed additives in ration of livestock and poultry	1
	Toxic element and antinutritional factors in feeds.	1
	Use of antibiotics, growth hormonal compounds, and other growth stimulants.	1

	Total	28
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Practical

Major topic	Minor topics	No. of lectures
	Under standing of general precautions while working in Nutrition Laboratories.	1
	Preparation of standard solution of different strength	1
	Preparation of standard solution of alkalis and alcohols.	1
	Preparation of common reagent and indicators.	1
	Preparation of samples herbage, faeces, and silage	1
	Weighing of samples for proximate analysis.	1
	Proximate principle of feeds, main features of weende's system of analysis	1
	Estimation of dry matter	1
	Estimation of total ash	1
	Estimation of acid insoluble ash in feed samples.	1
	Identification of feed stuff	1
	" " "	1
	" " "	1
	Total	13

Reference

- Benerjee, G.C. 1984. The text book of Animal Husbandary. Published by Mohan Primlani for Oxford and IBH publishing Co. Pvt. Ltd.
- Benerjee, G.C.1986. A Text book of Animal Nutrition.Publishing by Mohan Primlani for Oxford and IBH publishing Co. Pvt. Ltd.
- Morision, F.B. 1984. Feeds and feeding. C.B.S. Publishers and distribution, Jain Bhawan , Bhol Nath Nagar Delhi, India.
- Ranjhan, S.K . 1993 Animal Nutrition and Feeding Practices in India, Vikash publishing house Pvt. Ltd., India.
- Singh, S.B. and M. Sapkota. Animal Nutrition and Fodder production. Publishing by T.U.IAAS Rampur.

THIRD SEMESTER**Course title: EVALUATION OF FEEDSTUFF AND FEED TECHNOLOGY****Course code: ANU-212****Cr.hrs: 1+1=2****Full marks: 75****Theory:50****Practical:25****Syllabus with breakdown****Theory**

Major topic	Minor topics	No. of lectures
	Common feeds and fodders, their classification, availability and importance for livestock and poultry production	1
	Chemical composition and nutritive value of various feed and fodders.	1
	Measures of food energy and its applications	1
	Measures of gross energy, digestible energy, metabolisable energy	1
	Measures net energy, total digestible nutrients, starch equivalent, food units, physiological fuel value	1
	Methods of gross energy determination: direct/ indirect calorimetry, C: N balance studies	1
	Protein, evaluation of feeds	1
	Protein quality in ruminants	1
	Protein quality in non-ruminants	1
	Measurement of food protein (biological value of protein, protein efficiency ratio, protein equivalent, digestible crude protein. Calorie protein ratio. Nutritive ratio)	1
	Physical, Chemical and biological methods of improving the utilization of poor quality roughages.	1
	Methods of processing feed ingredients for preparation of feed mixture	1
	Storage and conservation of feeds and forages (hay) and their uses in livestock feeding	1
	Storage and conservation of feeds and forages (silage) and their uses in livestock feeding	1
	Harmful natural constituents and common adultrants of feeds and fodders	1
	Total	15

Practical

Major topic	Minor topics	No. of lectures
Determination	Proximate principles of feed	1
Estimation	Crude protein	1
	Ether extract	1
	Crude fibre	1
	Nitrogen free extract	1
	Calcium in feed samples	1
	Phosphorus in feed samples	1
Demonstration	Detergent method of forage analysis	1
	Laboratory ensiling of green fodders and Plastic Silage bag technology	1
Detection	Qualitative detection of undesirable constituents and common adulterants of feed	1
	" " "	1
Mixing	Feed mixing (selection of material for quality control, feed processing)	1
Pit preparation	Silage pit preparation and Hay Preparation	1
Total		13

Reference

- Benerjee, G.C. 1984. The textbook of Animal Husbandary. Published by Mohan Primlani for Oxford and IBH publishing Co. Pvt. Ltd.
- Benerjee, G.C.1986. A Textbook of Animal Nutrition.Publishing by Mohan Primlani for Oxford and IBH publishing Co. Pvt. Ltd.
- Morision, F.B. 1984. Feeds and feeding. C.B.S. Publishers and distribution, Jain Bhawan, Bhola Nath Nagar Delhi, India.
- Ranjhan, S.K. 1993 Animal Nutrition and Feeding Practices in India, Vikash publishing house Pvt, Ltd India.
- Singh, S.B. and M. Sapkota. Animal Nutrition and Fodder production. Publishing by T.U.IAAS Rampur.

THIRD SEMESTER**Course title: GENERAL VETERINARY PARASITOLOGY****Course code: VPA-211****Cr.hrs: 1+1=2****Full marks: 50****Theory:25****Practical:25****Syllabus with breakdown****Theory**

Major field	Topics	No. of lectures
	Introduction of parasitology, history, definitions. Importance of Parasitology in Veterinary curriculum	1
	" " "	1
	Parasites and parasitism. Types of Parasitism. Commensalism, symbiosis and predatorism	1
	Types of host: Final and Intermediate hosts, paratenic host and reservoir hosts, natural and unnatural hosts.	1
	Host parasite relationship; mode of transmission of parasites and methods of dissemination of the infective stages of the parasites	1
	" " "	1
	Harm done by parasites, to the host (pathogenicity), specificity in relation to species, breed, sex and location, tissue reactions caused by parasites to the host, resistance of hosts to parasitic infections/infestation	1
	Importance of immunity against parasitic infections – natural and acquired immunity	1
	General control measures against parasitic(infections) diseases.	1
	Nomenclature of parasites, international, zoological nomenclature; rules and regulation, general classification of parasites. Characteristics of various Phyla: Protozoa, Arthropod, Platyhelminths, Nematelminths and Acanthocephala.	1
	" " "	1
	Types of development. Direct and indirect life cycles. Development of parasites in the host system.	1
	Importance of chemotherapy in relation to parasitic control program. Anthelmintic medication. Use and abuse of Antiparasitic drugs insecticides and acaricides in Veterinary Practice	1
	" " "	1
	Total	14

Practical

Major field	Topics	No. of lectures
Demonstration	Demonstration of the types of final and intermediate hosts	1
	Demonstration of different organs/tissues of the hosts affected with endo and ecto parasites	1
	" " "	1
	Demonstration of free living and parasitic stages of the parasites through charts, specimens	1
	Demonstration / observation of the types of life cycles of different parasites (direct and indirect life cycles).	1
	Demonstration of some Parasites culture in natural laboratory; Bermann technique, sporulation etc	1
	" " "	1
Visit to PM room	Visit to Postmortem room, slaughter house or museum to acquaint with the types of different parasites and gross lesion in host tissue (large and small animals, birds etc)	1
	" " "	1
Fecal examination	Faecal examination technique, Egg counts	1
Blood smear	Blood smear preparation – Thick and Thin smears. Staining of blood smears. .	1
Scrappings, washings, slide preparation	Examination of skin Scrapings and nasals washings	1
	Collections, fixation and preservation of parasites- making temporary & permanent mounts of parasites	1
Total		13

Reference

- Benerjee, G.C. 1984. The textbook of Animal Husbandary. Published by Mohan Primlani for Oxford and IBH publishing Co. Pvt. Ltd.
- Benerjee, G.C.1986. A Textbook of Animal Nutrition.Publishing by Mohan Primlani for Oxford and IBH publishing Co. Pvt. Ltd.
- Morision, F.B. 1984. Feeds and feeding. C.B.S. Publishers and distribution, Jain Bhawan, Bhola Nath Nagar Delhi, India.
- Ranjhan, S.K. 1993 Animal Nutrition and Feeding Practices in India, Vikash publishing house Pvt, Ltd India.

- Singh, S.B. and M. Sapkota. Animal Nutrition and Fodder production. Publishing by T.U.IAAS Rampur.

THIRD SEMESTER**Course title: GENERAL VETERINARY MICROBIOLOGY****Course code: VMC-211****Cr.hrs: 2+1=3****Full marks: 75****Theory:50****Practical:25****Syllabus with breakdown****Theory**

Major topic	Minor topics	No.of lectures
General	Highlight on developmental history of Veterinary Microbiology.	1
	Microbiology of unicellular organisms and their classification.	1
	Microscopy-bright field, dark field, ultraviolet, fluorescent, phasecontrast and electron microscope and their modified applications.	1
	" " "	1
Bacteria	Morphology and structure of bacteria, shape, size and arrangement of bacteria, morphological variations.	1
	Cell wall, capsule, nucleus, cytoplasmic inclusions, flagella, motility, endospores, sporulation, vegetative reproduction.	1
	Bacterial stains, staining principles of gram, acid fast and endospore, flagella and capsular staining.	1
	" " "	1
	Cultivation of bacteria, nutritive requirements of bacteria, culture media	1
	reproduction and growth rate, growth curve of bacterial population, continuous culture of bacteria and measurement of growth.	1
	Isolation and identification of bacteria in pure culture, cultural characteristics on solid medium, aerobic and anaerobic cultivation and identification of bacteria.	1
	" " "	1
	Distribution of bacteria and other microbes. Sources of infections. Methods of transmission of infections.	1
	Sterilisation, disinfection, and evaluation of disinfectants and antiseptics: phenol coefficient. Factors influencing sterilization and disinfection.	1
	Break in asepsis and defective sterilisation. Antibiotics and antimetabolites and their mode of action	1
	Aseptic handling of sterilized materials; disinfection of animals.	1
	Life of sterile status.	1
Bacterial metabolism	Energy relationship, source of energy and catabolism, dissimilation of carbohydrates, proteins and fats.	1
	Classification and nomenclature of bacteria.	1
	Bacterial genetics, mutation and variations associated with virulence, antigenicity and colonial characteristics.	1
	Plasmids and drug resistance, transformation, transduction and conjugation.	1
Fungi	Introduction, morphology, growth, nutrition, reproduction and classification of fungi.	1

Virus	General properties of virus	1
	Morphology, electron microscopy and size of viruses.	1
	Bacteriophage. Viral proteins, nucleic acids and lipids	1
	Purification of virus particles and reaction of viruses to physical and chemical agents.	1
	Classification and cultivation of viruses.	1
	replication of viruses	1
	Viral genetics and interactions	1
	Viral haemagglutination, interferons and inclusion bodies.	1
	Oncogenic and latent viruses.	1
	Total	31

Practical

Major topic	Minor topics	No. of lectures
Staining and media preparation	Microscopy and routines,	1
	Motility	1
	Staining (simple & Grams), Acid fast, Lactophenol cotton blue	1
	Special staining (Capsular, Spore staining Leishminn, Methylene blue staining)	1
	Sterilisation, evaluation of disinfectants, asepsis etc.,	1
	Preparation of reagents media.	1
Demonstration	Equipment and sterilization disinfection	1
	Culture characters,	1
	Aerobic cultivation, Anaerobic cultivation,	1
	Biochemical characters	1
	" " "	1
	Pathogenicity test	1
	Antibiogram	1
	Culture technique for fungus and Identification of Fungus	1
Total		14

Reference

- Clinical Veterinary Microbiology by P.J.Quinn, M.E. Carter, B.K. Markey and G.R. Carter.
- Diagnostic procedure in veterinary bacteriology and mycology by G.R.Carter and J.R.Cole.
- Applied Microbiology –Prasad.
- Techniques in Microbiology-Gupta.

THIRD SEMESTER**Course title: GENERAL VETERINARY PATHOLOGY****Course code: VPL-211****Cr.hrs: 2+1=3****Full marks: 75****Theory:50****Practical:25****Syllabus with breakdown****Theory**

Major topic	Minor topics	No. of lectures
Introduction and etiology	Introduction, history and scope of pathology, its relation with other discipline	1
	Definitions. Causes of diseases- intrinsic and extrinsic, nutritional	1
	Causes of diseases: physical, chemical and biological	1
Developmental disturbances	Anomalies and monsters.	1
Disturbance of circulation	Hyperemia, congestion	1
	Hemorrhage	1
	Thrombosis	1
	Embolism	1
	Infarction	1
	Oedema	1
	Shock	1
Disturbances of cell metabolism	Gout, hyaline degeneration	1
	Mucoid degeneration, amyloid infiltration, cloudy swelling	1
	Hydropic degeneration, fatty changes, classification, Ossification	1
	Disturbances of pigment metabolism: Icterus	1
	Necrosis, gangrene and P.M. changes.	1
Disturbances in growth	Atrophy, Aplasia Hyperplasia, Hypoplasia, Hypertrophy and metaplasia.	1
Inflammation	Definition, etiology and cardinal signs,	1
	Circulatory changes. increased vascular permeability	1
	Cellular change	1
	Phagocytosis and body defense.	1
	Classification of inflammation as per duration, per-acute, acute, sub-acute and chronic inflammation.	1
	Healing, fever	1
Concretions	Urolith, cholelith, sialolith, pancreolith, enterolith	1

Immune reactions	Hypersensitivity	1
	Autoimmunity	1
Total		26

Reference

- Veterinary Pathology CBS Publishers and Distributors, India –Ganti Sastry.
- Pathology of infectious diseases of domestic animals –H.V.S .Chauhan.
- Veterinary Pathology in the tropics –Mugera.
- General Veterinary Pathology- J.L. Vegad

THIRD SEMESTER**Course title: PRINCIPLES OF ANIMAL BREEDING****Course code: AGB-213****Cr.hrs: 1+1=2****Full marks: 50****Theory:25****Practical:25****Syllabus with breakdown****Theory**

Major topic	Minor topic	No.of lectures
	Basis for classification of breeds,	1
	Concept of environment and genotype.	1
	Important breeds of cattle with special reference to their importance, economic character and adaptability from breeding stand point (Indigenous and Exotic).	1
	Important breeds of buffalo with special reference to their importance, economic character and adaptability from breeding stand point (Indigenous and Exotic).	1
	Important breeds of sheep, goat with special reference to their importance, economic character and adaptability from breeding stand point (Indigenous and Exotic).	1
	Important breeds of pig, poultry, and ducks with special reference to their importance, economic character and adaptability from breeding stand point (Indigenous and Exotic).	1
	Preliminary ideas of heritability and repeatability	1
	Genetic and phenotypic correlations of different economic traits.	1
	Aids to selection, methods of selection (Tandom, Independent-culling-level and total score), basis of selection	1
	Response to selection and its measures, selection differential,	1
	Sire index, selection index.	1
	Recurrent and reciprocal recurrent selection	1
	Establishment of new breeds.	1
	Total	13

Practical

Major topic	Minor topics	No.of lectures
Computation	Selection differential	1
	Sireindex	1
	"	1
	Selection index	1
	Genetic gain	1
	Heritability	1
	Repeatability	1
	Genetic correlation	1
	Environmental correlation	1
	Culling of livestock and poultry	1
	Preparation of pedigree sheets for farm animals	1
	Preparation of pedigree sheets for pet animals	1
	Preparation of pedigree sheets for companion animals	1
Total		13

Reference

- Lasley, J.F. (1978), Genetic of Livestock Improvement. Prentice –Hall of India Pvt.Ltd.New Delhi, India.
- Mukerjee, D.P.and Banerjee, G.C.Genetic and Breeding of farm animals. Oxford and IBH Publishing Co.Pvt.Ltd, Delhi India.
- Stansfield W.W.Theory and Problems of Genetics. Schaum’s Outline series. Tata McGraw Hill Publishing Co.Ltd. New Delhi, India.
- Stickberger, M.W. (2001) Genetics. Third edition. Prentice –Hall of India Pvt.Ltd.New Delhi, India.

FOURTH SEMESTER**Course title: APPLIED ANATOMY****Course code: VAN-225****Cr.Hrs: 0+2=2****Full marks:50****Theory: 0****Practical:50****Syllabus with breakdown****Practical**

Major field	Topics	No. of lectures
	Study of dissected specimens of ox/buffalo and other species and comparison with live animals	1
	Study of dissected specimens of ox/buffalo and other species and comparison with live animals	1
	Surface anatomy and gross anatomical structures involved in the surgical interferences viz. extirpation of eye ball,	1
	Amputation of horn	1
	Legation of stenson's duct,	1
	Zepp's operation	1
	Tracheotomy	1
	Oesophagotomy	1
	Amputation of fore and hind limb	1
	Nerve blocks and neurectomy of ulnar, volar, nerves	1
	Neurectomy of tibial, plantar nerves	1
	Medial patellar desmotomy	1
	Amputation of tail,	1
	Laparotomy, ruminotomy	1
	Gastrotomy	1
	Ovario hyseterectomy,	1
	Cystotomy, urethrotomy,	1
	Caesarian section	1
	Vasectomy and castration in ox and other species.	1
	Comparative study of the organs of (female and male) reproduction in ox/buffalo, sheep/goat, dog, rabbit, fowl, etc.	1
	Topographic anatomy of large and small animals –contours of body cavities, location and contours of visceral organs	1
	Regions of percussion, para-centesis, biopsy etc. location of peripheral lymph nodes. Location of surface veins, palpable arteries etc.	1
	Gross anatomical visualisation of various regions of domestic animals through plane and contrast radiography.	1
	Demonstration of the principles of biomechanics (Kinetic and Dynamic) through slides/radiographs.	1
	Gross anatomic study in post mortem.	1
	Histology of organs of importance in forensic medicine.	1
	Total	26

Reference

- Textbook of Veterinary Anatomy-Dye
- Miller's Anatomy of Dog.
- A systemic Study of Anatomy-Donald R. Adams.
- Guide to the Dissection of the Dog-Howard E.Evans.
- Ruminants Surgery-R.P.S.Tyagi.

FOURTH SEMESTER

Course title: VETERINARY PHYSIOLOGY I(Growth, Environment and Climatology)

Course code: VPY-224

Cr.Hrs: 1+1=2

Full marks: 50

Theory:25

Practical:25

Syllabus with breakdown**Theory**

Major field	Topics	No. of Lecture
Growth and environment	Animal ecology, physiology of growth	1
	" " "	1
	Regulation of growth, factors affecting efficiency of growth	1
	" " "	1
	Impact of climate change in various aspects of growth and reproduction	1
	" " "	1
	Physical reactions to environmental changes	1
	Physiology of behavior	1
Climatology	Various parameters and their importance	1
	Reaction of animals to different environmental variation, viz. temperature and fever; central control of heat regulation.	1
	" " "	1
	Temperature regulation in birds.	1
	" " "	1
Total		13

Practical

Major field	Topics	No. of Lecture
	Measures and measurements of growth in various species.	1
	" " "	1
	Physiological changes related to climate	1
	" " "	1
	" " "	1
	Instruments and equipments used in climatology, meteorological assessments	1

	"	"	"	1
	"	"	"	1
	Demonstration of stress and its physiological effects in various animals (effect of extreme heat and cold, effect of starvation, water deprivation, fear and excitement, bath, etc on physiological parameters)			1
	"	"	"	1
	"	"	"	1
	"	"	"	1
Total				11

Reference

- Animal physiology-Arora
- Animal physiology-Kanta
- Physiology of Domestic Animal-Dukes
- Veterinary Physiology- Cunninghams
- Biological Sciences- F.J. Taylor *et.al.*,

FOURTH SEMESTER**Course title: APPLIED NUTRITION-I(Livestock feeding)****Course code: ANU- 223****Cr.Hrs: 2+1=3****Full marks: 75****Theory: 50****Practical: 25****Syllabus with breakdown****Theory**

Major field	Topics	No. of Lectures
	Importance of scientific feeding, Feeding experiments, different methods of feeding experiments digestion and metabolic trials	1
	Norms adopted in conducting digestion trial - measurement of digestibility by conventional methods, indirect method of determining digestibility, indicator method of determining digestibility.	1
	Pasture consumption and digestibility	1
	Factors affecting digestibility of a feed, nutritive requirements of livestock and poultry-Energy and protein requirement for maintenance and production.	1
	Methods adopted for arriving energy and protein requirements for maintenance and production in terms of growth, reproduction, milk, egg, meat, wool and work.	1
	Balanced rations and its characteristics & feeding of dairy cattle and buffaloes.	1
	Nutritive requirements for various categories of poultry & formulation of ration as per I.S.I. & NRC specification.	1
	Nutritive requirements of swine and formulation of ration as per I. S. I. & ARC specification.	1
	Feeding standards, their uses and significance, merit and demerits of various feeding standards.	1
	Utilisation of agro-industrial by products and agricultural wastes as animal feeds.	1
	Utilisation of unconventional feeds. Use of urea molasses with concentrate and forages.	1
	Use of feed additives, antibiotics, and hormones.	1
	Economics and efficiency of food conversion to animal products in farms animals, Diet Schedules for hand fed individual animals	1
Feeding of cattle	Calf, growing animals, mature dry animals, lactating and pregnant cows, breeding bull and working bullock.	1
	" " "	1
Feeding of buffaloes	Calf, growing animals, mature dry animals, fattening animals, lactating and pregnant she-buffaloes, breeding bulls and working animals	1
	" " "	1
Feeding of goats	Kids, growers, lactating and pregnant doe, meat producers.	1
	" " "	1

Feeding of sheep	Lambs, growers, lactating and pregnant ewe, breeding rams, wool producers.	1
	" " "	1
Feeding of pigs	Piglets, growers, lactating and pregnant sows, breeding boars, fattening animals.	1
	" " "	1
Feeding of ducks	Starter (for meat and egg production), growers, broilers, layers.	1
	" " "	1
Feeding of poultry	Starter, growers, layers, broiler starter, broiler finisher.	1
Total		26

Practical

Major field	Topics	No. of Lectures
	Demonstration of conducting digestion trial in ruminants	1
	Calculation of nutritive value in terms of DCP, TDN and SE in feeds and fodders.	1
	" " " " "	1
	Calculation of requirements of nutrients in terms of DCP, TDN and ME for maintenance, growth and other types of production like meat, milk, wool, reproduction and work.	1
	" " " " "	1
	Formulation of rations for different livestock under different conditions.	1
	Formulation of rations for poultry and swine with conventional and unconventional feed ingredients.	1
	" " " " "	1
	Principles of compounding and mixing of feeds.	1
	Formulation of rations for feeding livestock during scarcity periods.	1
	Demonstration of the methods for improving the nutritive quality of straws and other crop residues.	1
	Visit to feed factory	1
	Visit to feed dairy farms	1
	Visit to poultry farms	1
Total		14

Reference

- Benerjee, G.C. 1984. The textbook of Animal Husbandary. Published by Mohan Primlani for Oxford and IBH publishing Co. Pvt. Ltd.
- Benerjee, G.C.1986. A Text book of Animal Nutrition.Publishing by Mohan Primlani for Oxford and IBH publishing Co. Pvt. Ltd.
- Morision, F.B. 1984. Feeds and feeding. C.B.S. Publishers and distribution, Jain Bhawan, Bhola Nath Nagar Delhi, India.
- Ranjhan, S.K. 1993 Animal Nutrition and Feeding Practices in India, Vikash publishing house Pvt, Ltd India.

- Singh, S.B. and M. Sapkota. Animal Nutrition and Fodder production. Publishing by T.U.IAAS Rampur.
- Rajhan, S.K. 1993. Animal Nutrition and feeding Practices in India. Vikash publishing house Pvt.Ltd, India.

FOURTH SEMESTER**Course title: APPLIED NUTRITION-II****Course code: ANU- 224****Cr.Hrs: 1+1=2****Full marks: 50****Theory: 25****Practical: 25****Syllabus with breakdown****Theory**

Major field	Topics	No. of lectures
	Dietary principles and food pattern of simple stomachs. Nutrients and their role in living systems. Composition of adult animal body.	1
	Composition of selected food stuff with reference to selected amino acids, carbohydrate and fat as source of energy;	1
	Role of water and minerals in body, importance of vitamins. Selected of foods as sources of vitamins, Dietary allowances.	1
	Requirements and recommended amounts of calories. Proteins, minerals and vitamins for different groups. Nutritional potentiality of important feed ingredients for balanced diets.	1
	Effect of processing on nutritive value of feeding stuffs.	1
	Preservation of feeds and its importance simple stomach diets and their improvements in practice	1
	Importance of colostrum and suckling, composition of different milk formulae. Feeding and care of expectant and nursing mothers.	1
	Modification of normal diet in selected conditions. Diet charts for growing pups, sick and old animals.	1
Dog nutrition	Nutrient requirement of dogs and cats, Diet formulation and preparation for various age groups of dogs and cats.	1
Rat nutrition	Nutrient requirement of rat, Significance of CHO, lipids, protein and amino acids, minerals and vitamins in rat nutrition	1
	Diet formulation, preparation, and feeding practices.	1
Guinea pig nutrition	Nutrient requirement of Guinea pigs. Significance of CHO, lipids, protein and amino acids, minerals and vitamins in Guinea pig nutrition.	1
Rabbit nutrition	Nutrient requirement of rabbit, Significance of CHO, lipids, protein and amino acids, minerals and vitamins in rabbit nutrition. Diet formulation, preparation, and feeding practices.	1
Total		13

Practical

Major field	Topics	No. of lectures
	Planning for balanced feeding	1
	Diet charts	1
Preparation of diet	Preparation of balanced diet for new born as oral and intravenous feeds.	1
	Preparation of balanced diet for growing animals as oral and intravenous feeds.	1
	Preparation of balanced diet for sick animals as oral and intravenous feeds.	1
	Preparation of modified diet under selected conditions	1
	Hygienic preparation of foods.	1
	Preservation of foods.	1

	Storage of foods	1
Visit	Visit to rural areas for observing feeding habits/animal feeding routines; storage.	1
	Visit to urban areas for observing feeding habits/animal feeding routines; storage	1
Total		12

Reference

- Benerjee, G.C. 1984. The textbook of Animal Husbandary. Published by Mohan Primlani for Oxford and IBH publishing Co. Pvt. Ltd.
- Benerjee, G.C.1986. A Textbook of Animal Nutrition.Publishing by Mohan Primlani for Oxford and IBH publishing Co. Pvt. Ltd.
- Morision, F.B. 1984. Feeds and feeding. C.B.S. Publishers and distribution, Jain Bhawan, Bhol Nath Nagar Delhi, India.
- Ranjhan, S.K. 1993 Animal Nutrition and Feeding Practices in India, Vikash publishing house Pvt, Ltd India.
- Singh, S.B. and M. Sapkota. Animal Nutrition and Fodder production. Publishing by T.U.IAAS Rampur.
- Rajhan, S.K. 1993. Animal Nutrition and feeding Practices in India.Vikash publishing house Pvt.Ltd. India.

FOURTH SEMESTER**Course title: VETERINARY HELMINTHOLOGY****Course code: VPA -222****Cr.Hrs: 2+1=3****Full marks: 75****Theory: 50****Practical: 25****Syllabus with breakdown****Theory**

Major field	Topics	No. of lectures
General	General description of helminth parasites affecting domesticated animals and birds. Classification of helminthes, characteristics of platyhelminths, nemathelminth and acanthocephala	1
	Types of life histories and mode of transmission of helminth parasites	1
Helminthology	Important morphological features, life cycles, mode of transmission, pathogenesis, diagnosis, chemo-and immuno-prophylaxis and general control measures of the following helminth parasites	1
Trematodes	Intestinal flukes and liver flukes (Fasciolopsis, Fasciola, Dicrocoelium and Opisthorchis	1
	Blood flukes/ nasal Schistosomiasis, Cercarial dermatitis (Schistosoma and Ornithobilharzi	1
	Amphistomes/Immature amphistomiasis/ fluke diarrhoea: Paramphistomum	1
	Cotylophoron, Gastrodiscus, Gastrodiscoides, Gastrothules, Gigantocotyle and Pseudodiscus	1
	Lung flukes (Paragonimus), general revision of trematoda;	1
	Visceral Schistosomiasis - S. Spindale, S. indicom S. incognitum	1
	Fischoederius Sp. Thysanieza Sp. Hymenoleptis sp. Metastrongylus Sp.	1
Cestodes	General development and characteristic of tapeworms including broadfish tapeworms, (Diphyllobothrium) Development of Bladderworms.	1
Equine tapeworms	Anoplocephala, Paranoplocephal	1
Ruminant tapeworms	Moniezia, Avitellina and Stelesia	1
Canine tapeworms	Diphydium, Taenia, Multiceps and Echinococcus	1
	" " "	1
Poultry tapeworms	Daveniea, Cotugnia, Rillentina, Amoebotaenia	1
Nematodes	General Accounts of nematode parasites, life history and reproduction. Free-living and parasitic stages of nematode.	1
Large roundworm	Ascaris, Parascaris, Toxocara, Toxascaris, Ascaridia, Heterakis and Oxyuris	1
Bursate worms	Strongyloides, Strongylus	1
	Chabertia, Syngamus, Oesophagostomum	1
Kidney worms	Stephanurus, Dicctophyma	1
Hookworms	Anchylostoma, Agriostomum, Bunostomum, Trichostrongylus	1
	Ostertagia, cooperia, Nematodirus	1
Stomach worms:	Haemonchus, Mecistocirus	1
Tissue roundworms	Habronema, Thalezia, Spicrocerca, Gongylonema	1

Filarial worms	Dirofilaria, Parafilaria, Onchocerca, Setaria, Stephanofilaria	1
Lungworms	Dictyocaulus, Mullerius and Protostrongylus	1
Guinea worm Plasmic nematodes	Dracunculus; Trichinella, Trichuris	1
	Acanthocephala, Macracanthorhynchus. Parasitic vaccines; methods of preparation and application.	1
Total		29

Practical

Major field	Topics	No. of lectures
	Study of morphological characters of adults and their larval stages and damages caused by them.	1
	Method of collection helminth parasites.	1
	Method of fixation, preservation and mounting of helminth parasites.	1
Identification of parasites	Identification of important trematodes	1
	Identification of important cestodes	1
	Identification of important round worms.	1
Faecal examination	Examination of the faecal samples for the trematode, cestode and nematode eggs	1
	" " "	1
	Faecal egg count and larval culture	1
	worm count	1
Demonstration	Demonstration of the life cycle and development of the type species of Trematode	1
	Demonstration of the life cycle and development of the type species of Nematode	1
	Demonstration of the life cycle and development of the type species of Cestode	1
Total		13

Reference

- Helminths, Arthropods and Protozoa of Domesticated Animals, E.J.L. Soulsby, ELBS, and Bailliere and Classes, London.
- General Parasitology, Thomas C.Chang, Academic Press, Orlando, Florida 32887.
- Veterinary Parasitology, G.M. Urguhart *et. al.* Blackwell Science Ltd.
- Animal Parasitology, J.D. Smyth, Cambridge University Press.
- Textbook of Veterinary Parasitology, Norman D Levine, CBS Publisher and Distributor. Delhi.

FOURTH SEMESTER**Course title: VETERINARY IMMUNOLOGY AND SEROLOGY****Course code: VMC-222****Cr.Hrs: 2+1=3****Full marks: 75****Theory: 50****Practical: 25****Syllabus with breakdown****Theory**

Major field	Topics	No. of lectures
Immunology	Highlights on Veterinary immunology. Pathogenicity, virulence and infection	1
	Nature of microbial diseases - epizootics and enzootics, resistance and susceptibility of host	1
	Bacterimia, septicemia, toxemia, endotoxins and exotoxins. Type and grades of immunity	1
Immune system	Development of immune system, humoral and cellular- immune responses	1
	" " "	1
Antigens	Antigens; Definition, specificity, azoprotein, heterophil	1
	Blood group antigens	1
Antibodies	Chemical and physical properties	1
	Electrophoresis	1
	Structure and function of immunoglobulins	1
	Site and mechanism of antibody production.	1
	Theories of antibody production.	1
	Complement system.	1
Serological reactions	Agglutination	1
	Precipitation	1
	Isohaemagglutination, phagocytosis	1
	Opsonic index, cytolysis,	1
	Complement fixation	1
	Neutralization	1
	Toxin and antitoxin reaction, immunoflourescene.	1
Hypersensitivity	Hyper sensitivity - allergy, classification,	1
	Anaphylaxis.	1
	Arthus reaction and delayed type hypersensitivity,	1
Auto-immunity	Auto-immunity.	1
	" "	1
	Immunization of animals,	1
Immunoprophylaxis	Biological immunoprophylaxis and diagnosis of diseases	1
	Total	26

Practical

Major field	Topics	No. of lectures
Antigen, antisera and immunoglobulins	Preparation of antigen (Ultrasonification, Ultracentrifugation, Packaging and storage)	1
	Raising of antisera,	1
	Concentration of immunoglobulins	1
Serological tests	Agglutination (Plate, tube)	1
	Precipitation (AGPT, CIE, RIE)	1
	Indirect Agglutination (Latex, Co-agglutination, PHA, RPHA)	1
	Haemagglutination (HA)	1
	Haemagglutination inhibition (HI)	1
	ASHI, CFT	1
	IPT, FAT	1
	ELISA	1
	CMI response	1
Visit and appraisal	Veterinary biological laboratory	1
Total		13

Reference

- Basic Immunology-W.M.G. Amos.
- Immunology and Serology-Philip L. Carpenter.
- Immunology: Understanding the Immune System. -Klaus D. Elgert.
- Immunology-Benjamini.

FOURTH SEMESTER**Course title: SYSTEMIC PATHOLOGY****Course code: VPL-222****Cr.Hrs: 2+1=3****Full marks: 75****Theory: 50****Practical: 25****Syllabus with breakdown****Theory**

Major field	Topics	No. of lectures
Pathology of cardiovascular system:	Functional disturbances and malformation. Diseases of pericardium and myocardium	1
	Diseases of epicardium and endocardium.	1
	Changes in size of heart.	1
	Diseases of arteries and veins.	1
Hemopoietic system:	Diseases of lymph nodes, vessels and spleen.	1
	Conditions affecting blood and bone marrow; anemia.	1
Respiratory system	Diseases of the nasal cavity, larynx, bronchi	1
	Diseases of lungs	1
	Diseases of the pleura, emphysema	1
	Diseases of the atelectasis, pulmonary adenomatosis	1
Digestive system	Functional disturbances, diseases of the mouth, pharynx, salivary glands	1
	Diseases of oesophagus, stomach	1
	Diseases of intestine	1
	Diseases of liver, gall bladder and pancreas	1
Urinary system	Functional disturbances. Diseases of kidneys	1
	Diseases of ureters, bladder and urethra.	1
Genital system	Diseases of different organs of male genital system; Accessory sex glands	1
	" " "	1
	Diseases of different organs of female genital system; mammary glands	1
	" " "	1
Nervous system	Functional disturbances, reaction of nervous tissue to injury. Diseases of meninges, brain, and spinal cord.	1
Endocrine glands	Functional disturbances of adrenal, thyroid, thymus	1
	Functional disturbances of pituitary, parathyroid and pancreas.	1
	Disease of eye, ear	1
	Disease of skin, hoof/nail, horn etc	1
Musculoskeletal system	Different disease of muscle, bone and ligament.	1
Total		26

Practical

Major field	Topics	No. of lectures
P. M.	P.M. Examination of large animals	1
	P.M. Examination of small animals.	1
	Techniques of writing. P.M. examination report.	1
	Techniques of P.M. examination of medico-legal cases with collection and dispatch of morbid materials to forensic laboratory.	1
	Diagnosis on the basis of P.M. lesions.	1
Blood and urine examination	Clinical examination of blood of diseased animals and principles of interpretation of results.	1
	Clinical examination of urine of diseased animals and principles of interpretation of results.	1
Histopathological slides	Study of histopathological slides of organs of different systems.	1
	" " "	1
	" " "	1
Clinical pathology	Importance of clinical pathology in confirmation of disease and their value as legal evidence.	1
	Diseases that can be confirmed/substantiated through haematological examination.	1
	Diseases that can be confirmed through urine and other body fluid exam.	1
Total		13

Reference

- Veterinary Pathology CBS Publishers and Distributors, India –Ganti Sastry.
- Veterinary Clinical pathology, CBS Publishers, India. Ganti Sastry.
- Text book of Veterinary Special Pathology-Vegad.
- Text book of Veterinary General Pathology-Chauhan.
- Pathology of infectious diseases of domestic animals –H.V.S .Chauhan.
- Veterinary Pathology in the tropics –Mugera.

FOURTH SEMESTER**Course title: LIVESTOCK BREEDING SYSTEM****Course code: AGB-224****Cr.Hrs: 1+1=2****Full marks: 50****Theory: 25****Practical: 25****Syllabus with breakdown****Theory**

Major field	Topics	No. of lectures
Breeding methods	Different mating systems.	1
	Inbreeding and its measure, effects and application of inbreeding with its merits and demerits	1
	In-breeding coefficient and co-efficient of relationship.	1
	Line breeding; open nucleus breeding system, its merits, demerits application etc.	1
	Out breeding: strain crossing; cross breeding; its merit and demerits.	1
Heterosis	Definition, causes, measurement and its application in animal breeding	1
	Outcrossing, top crossing, grading up,	1
	Grading up, criss-crossing,	1
	Rotational crossing in-crossing and incross-breeding,	
	Species hybridisation.	1
	Performance records and standardizations.	
Breeding behaviour	Current breeding programs in the state and the country.	1
	Importance of breeding records in dairy cattle, buffaloes, sheep, goat, equines, canines, wild animals etc. Pedigree sheets.	1
	Total	13

Practical

Major field	Topics	No. of lectures
Computation	Computation of in-breeding coefficient	1
	" " "	1
	Computation of coefficient of relationship	1
	" " "	1
	Computation of heterosis	1
	" " "	1
Analysis	Analysis of breeding records of different livestock farms and their maintenance, milk recording.	1
	Analysis of breeding records of different poultry farms and their maintenance.	1
	Study of pedigree and history sheets of livestock and poultry farms.	1
Use of pedigree sheets	Use of pedigree sheets in the breeding of cattle, buffalo; their preparation and interpretation.	1
	Use of pedigree sheets in the breeding of sheep, goat; their preparation and interpretation.	1

	Use of pedigree sheets in the breeding of pig, horse; their preparation and interpretation.	1
	Use of pedigree sheets in the breeding of dogs, laboratory animals; their preparation and interpretation.	1
Total		13

Reference

- Lasley, J.F. (1978), Genetic of Livestock Improvement. Prentice –Hall of India Pvt.Ltd.New Delhi, India.
- Mukerjee, D.P.and Banerjee, G.C.Genetic and Bredding of farm animals. Oxford and IBH Publishing Co.Pvt.Ltd, Delhi India.
- Stansfield W.W.Theory and Problems of Genetics. Schaum’s Outline series. Tata McGraw Hill Publishing Co.Ltd.New Delhi, India.
- Stickberger, M.W. (2001) Genetics. Third edition. Prentice –Hall of India Pvt.Ltd.New Delhi, India.

FIFTH SEMESTER**Course Title: GENERAL AND C.N.S. PHARMACOLOGY****Course Code: VPT-311****Cr.hrs: 2+1=3****Full Marks:75****Theory: 50****Practical:25****Syllabus with breakdown****Theory**

Major topic	Minor topics	No.of lectures
Introduction to Pharmacology	Historical development branches and scope of Pharmacology.	1
	Sources of drugs	1
	Pharmacological terms and definitions.	1
Principles of drug activity	Pharmacokinetics -absorption,	1
	“ distribution	1
	“ biotransformation	1
	“ excretion of drugs	1
	Pharmacodynamics -Concept of drug and receptor	1
	“ dose response relationship	1
	Terms related to drug activity	1
	Factors modifying the drug effect and dosage	1
Drug acting on CNS	History and theories of general anaesthesia	1
	Volatile, gaseous anaesthetics	1
	Intravenous and dissociative anaesthetics	1
	Hypnotics	1
	Sedatives	1
	Tranquilizers	1
	Mood elevators	
	Analgesics	1
	Antipyretics	1
	Anti-inflammatory agents	1
	Transmitters of the CNS analeptics and other stimulants	1
Anesthetics	Local anaesthetics (analgesics)	1
Muscle relaxants	Neuromuscular blocking agent: peripheral muscle relaxants	1
	Neuromuscular blocking agent: central muscle relaxants.	1
Total		25

Practical

Major topic	Minor topic	No.of lectures
Pharmacy	Fitting and apparatus, labeling	1
	Custody of poisons	1
	Weighing of drugs, compounding of preparation	1
	Meteorology: system of weighs and measures	1
	Pharmacy calculations, pharmaceutical process	1
	Incompatibilities	1
	Sources and composition of drugs , pharmaceutical preparations	1
	Definition of pharmacological terms related to various systems	1
	Drug standards and regulations prescription writing	1
	Demonstration	Effect of CNS depressants, analgesics
CNS stimulants		1
Muscle relaxants		1
Local anesthetics in laboratory animals		1
Total		13

Reference

- Akhtar, M.S. (1984). *Introduction to Veterinary Pharmacology and Therapeutics*. 2nd edition. University of Faisalabad. Faisalabad. Pakistan.
- Booth, N.H. and McDonald, L.E. (1982). *Jones Veterinary Pharmacology and Therapeutics*. 5th edition. Kalyani Publishers. New Delhi. India
- Brander, G.C., Pugh, D.M., Bywater, R.J. and Jenkins, W.L. (1991). *Veterinary Applied Pharmacology and Therapeutics*. 5th edition. ELBS. London. U.K.
- Chaudhari, K.D. (1983). *Manual of Pharmacology*. 9th edition. Minati Chaudhari. Ranchi, India.
- Gilman, A.G., Goodman, L.S. and Gilman, A. (1980). *Pharmacological basis of therapeutics*. 6th edition. McMillan Publishing Company. New York. Roy, B.K. (2001). *Veterinary Pharmacology and Toxicology*. 1st edition. Kalyani Publishers. New Delhi. India

FIFTH SEMESTER**Course Title: Parasitology III (Entomology and Acarology)****Course Code: VPA 313****Cr.hrs: 1+1=2****Full Marks: 50****Theory:25****Practical:25****Syllabus with breakdown****Theory**

Major Topics	Minor topic	No.of lectures
Entomology	Introduction of arthropoda, General description of Insecta and Archmida affecting domesticated animals and birds	1
	Historical account and classification of Arthropod. Arthropoda as disease transmitters/general morphological features of arthropod.	1
	Arthropod as direct/indirect parasites. Economic losses to hides and skins due to ectoparasitic infestation	1
	General bionomics, life cycles, vector potentiality, pathogenesis and control of following important arthropods affecting man, animals and birds. The biting midges (Culicoides), Black flies or buffalo ganats (Simulium) and Sand flies (Phlebotomus)	1
	The mosquitoes (Culex, Anopheles, Aedes). The Horse flies (Tabanus)	1
	Warbles (Hypoderma) and Bots (Gastrophilus).	1
	The bottle flies; Myasia.	1
	The wingless flies (Hippobosca, Malophagus, Pseudolynchia); Bugs (Cimex).	1
	Lice and fleas. (Haematopinus, Linognathus, Trichodectes, Manoppon).	1
	Lice and fleas, (Pulex, Ctenocephalides, Echinophaga).	1
Acarology	General description and characters of class Arachnida. Anatomical features of mouth parts. General description of the order Acarina/Ticks and mites infestation in animals.	1
	Ticks: Soft ticks, (Argas, Ornithodoros)	1
	Hard ticks: (Ixodes, Boophilus, Hyalomma, Rhipicephalus, Haemophysalis, Dermacentor) Mites: red mite of poultry (Dermanyssus)	1
	Parasitic mites: (Demodex Sarcoptes, Psoroptes, chorioptes and Pentastomides).	1
	Musca sp, Stomoxys sp, Damalinia sp, Menacanthus sp, Lipeurus sp, Otobius sp., Megninia sp, amblyomma sp.	1
	Total	15

Practical

Major topic	Minor topic	No. of lectures
Demonstration	Demonstration of the type representatives of various groups of insects through charts, specimen	1
	Demonstration of the type representatives of various groups of insects through mounted slides	1
	Demonstration of the type representatives of various groups of ticks through charts, specimens	1
	Demonstration of the type representatives of various groups of ticks mounted slides	1
	Demonstration of the type representatives of various groups of mites through charts, specimen	1
	Demonstration of the type representatives of various groups of mites through mounted slides	1
	Demonstration of differential characters of Insecta	1
	Demonstration of differential characters of Acarina	1
	Procedure for diagnosis of arthropod infestation to hides and skin	1
	Demonstration of enteric myiasis	1
Collection	Procedures for the collection of arthropod parasites.	1
	Procedures for the fixation, preservation and mounting of arthropod parasites.	1
Total		12

Reference:

- Helminths, Arthropods and Protozoa of Domesticated Animals, E.J.L. Soulsby, ELBS, and Bailliere and Classes, London.
- General Parasitology, Thomas C.Chang, Academic Press, Orlando, Florida 32887.
- Veterinary Parasitology, G.M. Urguhart *et. al.* Blackwell Science Ltd.
- Animal Parasitology, J.D. Smyth, Cambridge University Press.
- Textbook of Veterinary Parasitology, Norman D Levine, CBS Publisher and Distributor. Delhi.
- Veterinary Parasitology, G.M. Urguhart *et.al.* Blackwell Science Ltd.
- Manual of tropical Veterinary Parasitology, Published by CAB international.
- Arthropods in Livestock and Poultry Production, J.N. Lancaster, M.V.Meisch.
- Acarology, Volume I and II, D.A.Griffiths and C.E. Bowman, Holsted Press.

FIFTH SEMESTER**Course Title: VETERINARY BACTERIOLOGY AND MYCOLOGY****Course Code: VMC-313****Cr.hrs: 2+1=3****Full Marks: 75****Theory: 50****Practical: 25****Syllabus with breakdown****Theory**

Major topic	Minor topic	No. of lectures
Bacteria	Study of following important bacteria in relation to their morphology, isolation, growth, colonial, biochemical and antigenic characters. Pathogenically and diagnosis of bacterial disease caused by the following: -	
	Leptospira	1
	Brucella	1
	Vibrio, Aeromonas	
	Pseudomonas	1
	Pasteurella, Yersinia	1
	Actinobacillus	1
	Enterobacteriaceae	1
	Staphylococcus	1
	Bacillus	1
	Clostridium, Listeria	1
	Erysipelothrix	1
	Corynebacterium	1
	Actinomyces	1
	Mycobacterium	1
	Nocardia, Sphaerophorus	1
	Bactericides, Haemophilus	1
	Bordetella, Moraxella, Spirochetes	1
	Rickettsia and Chlamydia	1
Fungi	Study of following important fungi in relation to their morphology, isolation, growth, colonial, biochemical and antigenic characters. Pathogenically and diagnosis of bacterial disease caused by the following:	
	Mycoplasmas and achleplasmas Fungi	1
	Superficial mycoses, contagious-dermatophytes	1
	Subcutaneous-Rhinosporidium, Sporotrichum fungi	1
	“ Candida, mycetomal fungi	1
	Systemic- Histoplasma, Cryptococcus	1
	“ Aspergillus, Zygomycetes and others	1
	Rare - Pencillium, others Fungi causing mastitis and abortion	1
	Mycotoxin	1

Total**26****Practical**

Major topic	Minor topics	No. of lectures
Diseases	Anthrax	1
	H. S.	1
	B. Q.	1
	Enterotoxaemia	1
	Mastitis	1
	Respiratory and enteric infection	1
	Tuberculosis	1
	Brucellosis	1
	Johne's disease	1
	Aspergillosis	1
Demonstration	Demonstration of other agents of importance	1
	“ “ “	1
	“ “ “	1
	“ “ “	1
	Total	13

Reference

1. Veterinary Bacteriology and Virology by I.A. Merchant and R.A. Packer.
2. Medical Mycology by J.W. Rippon.
3. Bergey's Manual of Systemic bacteriology by N.R. Krieg.

FIFTH SEMESTER**Course Title: SPECIAL PATHOLOGY - I****Course Code: VPL-313****Cr.hrs: 2+1=3****Full Marks:75****Theory:50****Practical:25****Syllabus with breakdown****Theory**

Major topic	Minor topic	No. of lectures
Neoplasm	Neoplasm-Definition, general characteristics and classification.	1
	Difference between benign and malignant tumors. Causes of neoplasms	1
	Pathology of different types of tumours	1
	Tumour-immunity.	1
Diseases caused by viruses	General introduction; Pathology of F.M.D., vascular stomatitis, vascular exanthema	1
	Pathology of rabies, equine encephalomyelitis, scrapie, BSE , pseudo-rabies	1
	Pathology canine distemper, infectious canine hepatitis	1
Diseases caused by bacteria	Pathology of Hog-cholera, Rinderpest, PPR , African horse sickness	1
	Actinomycosis. Actinobacillosis,	1
	Tuberculosis, Paratuberculosis	1
	Nocardiosis, Anthrax	1
	B. Q., Bovine bacillary haemoglobinuria,	1
	Malignant oedema, Braxy	1
	Gas gangrene, Tetanus	1
	Enterotoxemia, Botulism	1
	Pathology of Streptococcal infections and Staphylococcal infections	1
	Pathology of mycotoxicosis	1
	Pathology of abortion, mastitis	1
	Pathology of HS, Glander and Leptospirosis.	1
	Pathology of diseases caused by fungus	1
Pathology of diseases caused by helminths	1	
Pathology of diseases caused by protozoa.	1	
Biopsy	Scope of biopsy and limitation in the diagnosis of lesions	1
Cytology	Cytology - as a method of disease diagnosis; Exfoliative cytology its scope and limitation.	1
Postmortem	Procedure for preparation of post-mortem report.	1
	Legal implication of post mortem.	1
Total		26

Practical

Major topic	Minor topics	No. of lectures
Specimens and slides	Studies of gross specimens of diseases and diagnosis	1
	“ “ “	1
	Special staining of causative organisms of different infectious diseases	1
	“ “ “	1
	Slides of systemic diseases	1
	Slides of diseases caused by infection	1
	Slides of diseases caused by infestations	1
	Slides of diseases caused by toxic and metabolic agents.	1
Demonstration	Demonstration of Exfoliative cytology	1
	Demonstration of cytological examination	1
	Biopsy, Collection of various body fluids	1
	Frozen sectioning	1
	“ “	1
	Total	13

Reference

- Veterinary Pathology CBS Publishers and Distributors, India –Ganti Sastry.
- Veterinary Clinical pathology, CBS Publishers, India. Ganti Sastry.
- Textbook of Veterinary Special Pathology-Vegad.
- Textbook of Veterinary General Pathology-Chauhan.
- Pathology of infectious diseases of domestic animals –H.V.S. Chauhan.
- Veterinary Pathology in the tropics –Mugera.

FIFTH SEMESTER

Course Title: VETERINARY PUBLIC HEALTH (MILK HYGIENE AND PUBLIC HEALTH)

Course Code: VPH-311

Cr.hrs: 1+1=2

Full Marks: 50

Theory: 25

Practical: 25

Syllabus with breakdown**Theory**

Major topic	Minor topics	No.of lectures
	Introduction; definition of Veterinary public Health	1
	Milk hygiene in relation to public health	1
	Microbial flora of milk and milk products.	1
	Sources of bacterial contamination of raw milk and method of control	1
	Clean milk production, sources of contamination during collection and transport	1
	Sources of contamination during processing of milk and methods of control.	1
	Hygienic control of dairy equipment.	1
	Hygienic aspect of processing of dairy products	1
	Quality control of milk and milk products	1
	Milk hygiene practice in Nepal and other countries	1
	Principles of milk legislation	1
	Milk borne diseases and methods of control	1
	Bacteriophage in milk; germicidal property of milk	1
	Total	13

Practical

Major topic	Minor topic	No. of lectures
	Collection of milk samples for chemical and bacteriological examination	1
	Grading of milk on the basis of MBR test	1
	Detection of antibiotic residues in milk and milk products	1
	Test for pasteurization	1
	Test of plant sanitation	1
	Bacteriological examination of raw milk for processing plants viz. its S.P.C. coliform counts faecal streptococcal count, Psychrophilic, mesophilic and thermophilic count.	1
	Bacteriological examination of pasteurized milk for processing plant viz. its S.P.C. coliform count faecal streptococcal count, Psychrophilic, mesophilic and thermophilic count	1
	Bacteriological examination of milk products for processing plant viz. its S.P.C. coliform count faecal streptococcal count, Psychrophilic, mesophilic and thermophilic count	1
	Bacteriological examination of water for processing plants viz. its S.P.C. coliform count faecal streptococcal count, Psychrophilic, mesophilic and thermophilic count.	1
	Detection of adulteration and detection of preservatives in milk	1
	Detection of adulteration in ghee	1
	Isolation and identification of organisms of public health significance from milk and its products	1
	Test of mastitic milk in relation to public health	1
Total		13

Reference

1. Veterinary Medicine and Human Health-Cavin W.Schwabe.
2. Parasite Zoonoses-S.C. Pacija.

FIFTH SEMESTER**Course Title: SWINE/EQUINE/YAK PRODUCTION AND MANAGEMENT****Course Code: LPM-314****Cr.hrs: 1+1=2****Full Marks:50****Theory:25****Practical:25****Syllabus with breakdown****Theory**

Major topic	Minor topic	No. of lectures
Swine	Introduction and scope of swine farming in the country census, breeds and distribution of swine	1
	Management of breeding and pregnant sows; Care and management of sows at farrowing and after farrowing	1
	Care and management of pig-lets, growing stock, lactating sows, feedlot stock.	1
	Selection and breeding technique in swine, Management for optimal production; swine feed and feeding	1
	Housing of swine; vaccination, disease detection and parasitic control in swine	1
	Slaughter and preservation of swine products; marketing of different pig products in Nepal and abroad; economics of pig production	1
Equine	Equine population of Nepal and abroad. Horses, donkeys and mules and their utility in our country. Identification of horses by their breeds, colour and markings (as per R W T C I).	1
	Dentition and ageing of horses. Handling, care and routine management of equines. Health care routines for horses.	1
	Colic and its prevention. Hygiene and management of stable. Feeding routine for horse, donkeys and mules. Control of external and internal parasites of horse	1
	Stable and its management. Grooming, saddling and exercising horses, vices of horses. Foot care and shoeing care of stallion – mating of horses- broodmare and its care.	1
	Foaling and care of new born. Breeding mules. Race clubs. Race horses and their care-Doping, its detection-control of horse for examination. Passing stomach tube; grooming, saddling & riding. Exercising horses, walking, trotting, cantering and galloping.	1
Yak	Yak as domesticated animal. Utility of yaks. Feeds and feeding of yaks. The peculiarities of yak.	1
	Breeding of yaks. The yak x cattle crossing; hybrids from yak. Common ailments of yak. Controlling of yak.	1
	Adaptation of yak to high altitude. The milk and its composition. Yak meat and its production.	1
Total		14

Practical

Major topic	Minor topics	No.of lectures
Swine	Identification of breeds- Nepalese and exotic swines, handling of swine	1
	Formulating rations for boar and sows; feeding growers, farrowing, lactating and pregnant animals.	1
	Routine inspection, identification of diseases, examination and control of parasites, vaccination and marketing	1
	Identification of pregnancy, care during pregnancy	1
	Isolation and care of farrowing sows, care of piglings.	1
	Castration, culling, tooth cutting	1
	Profit workouts for piggeries	1
	Preparation of feasibility reports and projects.	1
	Lay-out plans of swine houses;	1
	Routine operations of swine farms; marketing the swine	1
Equines	Passing stomach tube, grooming, saddling and riding.	1
	Exercising horses, walking, trotting, cantering and galloping.	1
	Care of race horses and preparing horses for show, application of exercise bandage, stable bandage.	1
	Visit to races, polo, and horse show	1
	Total	14

Reference

- Cattle Management – Cheryl May, Roston Publishing Company, Inc.Roston, Virginia.
- Textbook on Buffalo Production –C.K. Rajhan, N.N.Pathak.Vikas Publishing House Pvt.Ltd., New Delh

FIFTH SEMESTER**Course Title: WILD AND ZOO ANIMAL HEALTH CARE AND
MANAGEMENT/FISH PRODUCTION****Course Code: LPM-315****Cr.hrs: 1+1=2****Full Marks:50****Theory:25****Practical:25****Syllabus with breakdown****Theory**

Major topic	Minor topics	No. of Lectures
Wild and zoo animal management	Taxonomy of wild and zoo animals. Importance of management and health care of wild animals	1
	Habitats and housing of various class of wild animals	1
	Feeding habits , feeds and feeding system zoo animals and wild animals	1
	Principles and practices of reproduction and breeding in zoo animals and wild animals	1
	Methods of restraint of wild animals	1
	Capture, handling and physical examination of wild animals	1
	Common diseases and control strategies against it.	1
	Principles and practices in zoo management	1
	Zoo animal hygiene and disease prevention	1
*Welfare issues	Wild animal welfare	
Fish Production and Management	Introduction and importance of fish production (census and status) in Nepal	1
	Types of common fish for fresh water and in land cultivation.	1
	Economics of fish production.	1
	Lay out plan for inland fish culture	1
	Principle and practices of fish breeding	1
	Hatchery management practice	1
	Care and management of breeding stocks, eggs and fingerlings	1
	Spawn nursery and pond management	1
	Detection, diagnosis and control of fish diseases.	1
*Welfare issues	Welfare of fish	
Bee Keeping and Management	Types of common honey bees	1
	. Food values of honey..	1
	Layout, preparation of bee hives.	1
	Principles and practices of feeding bees	1
	Cure and maintenance of honey bees	1

	Common diseases of honey bees and their control.	1
	Total	26

Practical

Major topic	Minor topics	No. of lectures
Wild and zoo animals	Visit to zoo or national parks to familiarize the taxonomy of zoo and wild animals with the information of its distribution and habitat.	1
	Visit to zoo or national parks to familiarize types of food preparation and nutrition for different species of wild animals in captivity and zoo keeping	1
	Visit to zoo or national parks to familiarize types of housing or enclosures for shelter and husbandary practices in captive wild animals	1
	Methods of restraints and physical examination.	1
Fish production and management	Familirization visit to demonstration fish farm...	1
	Identification of exotic and indigenous species of fish.	1
	“ “ “	1
	Feed formulation and diet preparation and feeding fish	1

	Inspection and detection of sick and unhealthy fish	1
	Specimen collection and laboratory procedures for disease diagnosis	1
	Methods of administration of medicine to fish.	1
Bee keeping and management	Preparation of honey bee hives..	1
	“ “ “	1
	Honey bees feeding and management	1
	Extraction storage and marketing of honey.	1
	Total	15

Reference

- Wildlife Wealth of India (Researches and Management-T.C.Majupuria, Tecpress Service, L.P. Bangkok.
- Himalayan Wildlife: Habitat and Conservation-S.S. Negi. Indus Publishing Co. New Delhi.
- E.F.Phillips, Bee keeping.
- T.C. Majpuria, Wild life of Nepal

FIFTH SEMESTER

Course Title: LABORATORY ANIMAL/RABBIT/FUR ANIMAL CARE AND MANAGEMENT AND PET ANIMAL CARE

Course Code: LPM-316

Cr.hrs: 1+1=2

Full Marks:50

Theory:25

Practical:25

Syllabus with breakdown**Theory**

Major topic	Minor topic	No.of lectures
Laboratory animal	Importance of laboratory animal breeding. Care and housing standards of mice, rats, guinea pigs	1
	General consideration on feeding aspects and nutritional requirements of lab animals,	1
	Important consideration in breeding of laboratory animals, prophylactic measures for commonly occurring lab animal diseases	1
	Preliminary ideas on technology for production of specific pathogen free and germ free lab animals	1
Rabbit/fur animals	Introduction and scope of Rabbit/Fur animals farming in the country; census, breeds and their distribution in Nepal and abroad; Scope and limitation of rabbit/fur animal production;	1
	Selection, care and management for breeding for commercial purpose, Identification, care and management of farrowing animals and farrowing, care of new born, growing stock	1
	Harvesting of products; breeding and selection techniques for optimal production; Feeds and feeding for rabbit/fur animal production; housing of rabbit/fur animals	1
	Shearing/slaughtering and preservation of products; parasite control, hygienic care;	1
	Disposal, utilization and recycling of wastes etc. The economic aspects of rabbit/fur animal production; accounting their expenditure, income etc.	1
	Management of common diseases of rabbit- snuffles, canker, coccidiosis and mycotoxicosis.	1
Pet animal care	Breeds of dogs commonly seen in Nepal. Different breeds of dogs; handling a dog; Major breed traits of dogs. Selecting a breed to keep. Selection of a pup, feeding tips, Simple training, housebreaking, control of parasites.	1
	Vaccination schedules. Vices of dogs and how to correct them. Pedigree sheet; kennel clubs, dog shows, heat and its detection, breeding a dog, care of a pregnant female, whelping: care of mother and new born	1
	Utility dogs - defense, patrolling, riot control, scouting, espionage, mine detection, tracking, guiding, hunting, races, retrieving, life saving, guarding and other uses.	1
	Norms for tail docking, Ear cropping etc. Nail cutting, grooming, bathing and teeth hygiene for dogs	1

	Cats their breeds and habits. Food and feeding of cat. Kitten; their care and management. Prophylactic vaccination; handling cats for examination; administration of medicine, vices of cats.	1
	Common pets birds seen in Nepal Tips on their caging, breeding and management. Tips on health care of pets birds	1
Total		16

Practical

Major topic	Minor topic	No.of lectures
Laboratory animal	Identification of body parts and handling of laboratory animals	1
	, housing system and space requirements for laboratory animals, weighing sexing and weaning of laboratory animals	1
	Management and Marking for identification of laboratory animals for purpose of their individual recording	1
	Computation and compounding of balanced diet for laboratory animals mainly Mice, Rats, Guinea pigs and Rabbits.	1
	Feeding schedule of laboratory animals. Selection of breeding stock of laboratory animals for high breeding of efficiency.	1
	Maintenance of breeding records of laboratory animals. Prophylactic measures against common diseases of lab animals. Hygienic care and control of parasites (routines)	1
Pet animal care	Recognizing various breeds and their colors, handling dogs for examination	1
	Use of leads, choke collars; brushing and bathing a dog; deticking, deworming	1
	Exercising a dog. Detection of heat, mating, whelping (through video film or real)	1
	Care of newborn. weaning. Administration of medicine; Nail and tooth care, visit to dog show; clipping of hair in some breeds	1
	Hygiene of Pens, feeding utensils for dogs, pups	1
	Common breeds of cats, control, examination and medication of cats and kitten	1
	Identification of common pet birds. Handling of pet birds, their examination and administration of medicine	1
Total		13

Reference

1. Chakrabarti Amalendu, Dog care and management.
2. Angela Sayer and Howard Loxton- Encyclopedia of cat.
3. Prof, Dr. K.D.Budras, Dr, P.H. Mc. Carthy, Anatomy of dog- an illustrated text.

FIFTH SEMESTER**Course Title: MILK AND MILK PRODUCTS TECHNOLOGY****Course Code: LPT-311****Cr.hrs: 1+1=2****Full Marks:50****Theory:25****Practical:25****Syllabus with breakdown****Theory**

Major topic	Minor topic	No. of lectures
	Developments of dairy industry in Nepal	1
	Composition and nutritive value of milk. Factors affecting composition of milk	1
	Physical and chemical properties of milk	1
	Clean milk production; bacteriology and deterioration of milk	1
	Principles involved in pasteurization, homogenization and dehydration.	1
	Preparation of various concentrated and dehydrated milk products.	1
	Preparation of butter, ghee, khoa	1
	Preparation of lahssi, curd, ice-cream	
	Preparation of cheese	
	Packaging and distribution of milk; Legal, ISI and NSI standard of milk and milk products. Sanitation in milk plant	1
	Utilization of milk by-products. Role of milk and milk products in human nutrition.	1
	Storage, conservation and marketing of milk and milk products	1
	Total	13

Practical

Major topic	Minor topic	No. of lectures
	Sampling of milk, estimation of fat	1
	Estimation of S.N.F. and total solids	1
	Detection of adulteration of milk through various tests	1
	Estimation of efficiency of pasteurization through different tests	1
	Bacteriological examination of milk for their wholesomeness.	1
	Bacteriological examination of products for their wholesomeness.	1
	Preparation of milk products: curd	1
	Preparation of milk products: butter	1
	Preparation of milk products: ghee	1
	Preparation of milk products: yogurt, lahssi,	1
	Preparation of milk products: khoa	1
	Preparation of milk products: ice-cream	1
	Visit to dairy plant	1

Reference

- Milk and milk products-Eckles, Combs and Macy.
- Handbook of dairy science-K.C. Mahanta.
- A textbook of dairy chemistry- E.R.Ling.
- Principle of practices of dairy farm management-Jagdish Prasad.
- Principles of dairy chemistry-Jennes and Patton.
- Principles of dairy processing-James N. Warner.
- Milk and its properties-S.M. Shrivastava.
- Dairy technology in the tropics and subtropics-J.C.T.Van den Berg.
- Handbook of dairy Sciences-K.C.Mahanta.
- Lab guide in dairy Chemistry practical- C.L.David.
- Lab manual of dairy science –P.V.Jeleh and Negendra Sah.

SIXTH SEMESTER**Course Title: AUTONOMIC AND SYSTEMIC PHARMACOLOGY****Course Code: VPT-322****Cr.hrs: 2+1=3****Full Marks:75****Theory:50****Practical:25****Theory**

	Minor topics	No. of lectures
Drug acting on autonomic nervous system	Introduction to the autonomic nervous system, neurohumoral transmission	1
	Adrenergic antagonists, adrenoreceptor blockers	1
	Adrenergic neuron blockers	1
	Cholinergic antagonists and blockers	1
	Ganglionic stimulants and blockers	1
	Autocoids, histamine and antihistaminic agents	1
	5-hydroxy-tryptamine and its antagonists	1
	Prostaglandins, angiotensin, bradykinin	1
Drug acting on CVS	Cardiac glycosides, antiarrhythmic drugs	1
	Vasodilators and antihypertensive agents	1
	Haematinics, coagulants and anticoagulants	1
Drugs acting on digestive tract	Stomachics, antacids, intestinal astringents,	1
	Carminatives, antizymotics,	1
	Emetics, anti-emetics	1
	Purgatives, choleraetics and cholagogues	1
Drugs acting on respiratory system	Expectorants and antitussives,	1
	Respiratory stimulants, bronchial dilators	1
Drugs acting on urogenital system	Diuretics, Urinary alkalizes	1
	Acidifiers and antiseptics	1
	Fluid therapy, ecbolics	1
Endocrine pharmacology	Adrenocorticoids sex hormones, insulin	1
	Other hypoglycemic agents, and thyroid hormones	1
Vitamins	Only in relation to pharmacotherapeutic effects	1
	“ “ “	1
Drugs acting on skin and mucous membrane		1
		1
Total		26

Practical

Major topic	Minor topic	No. of lectures
Demonstration	Demonstration of the action of adrenergic agonists on isolated and intact preparations of animals	1
	Demonstration of the action of cholinergic agonists on isolated and intact preparations of animals	1
	Demonstration of the action of adrenergic blockers on isolated and intact preparations of animals	1
	Demonstration of the action of cholinergic blockers on isolated and intact preparations of animals	1
	Action of sympathomimetic drugs	1
	Action of parasympathomimetics drugs	1
	Action of sympathetic and parasympathetic blockers	1
	Action of ganglionics – stimulants and blockers	1
	Effect of drugs on E.C.G., blood pressure, and central venous pressure	1
Pharmacy preparation	Triple carb, antidiarrhoeal powder	1
	Dusting powder, iodine ointment with and without methyl salicylate	1
	Red iodide of mercury ointment, mistura alba	1
	Carminative mixture, ammonia liniment, turpentine liniment	1
Total		13

- *Applied Pharmacology and Therapeutics*. 5th edition. ELBS. London. U.K.
- Chaudhari, K.D. (1983). *Manual of Pharmacology*. 9th edition. Minati Chaudhari.

Reference

- Akhtar, M.S. (1984). *Introduction to Veterinary Pharmacology and Therapeutics*. 2nd edition. University of Faisalabad. Faisalabad. Pakistan.
- Booth, N.H. and McDonald, L.E. (1982). *Jones Veterinary Pharmacology and Therapeutics*. 5th edition. Kalyani Publishers. New Delhi. India
- Brander, G.C., Pugh, D.M., Bywater, R.J. and Jenkins, W.L. (1991). *Veterinary* Ranchi, India.
- Gilman, A.G., Goodman, L.S. and Gilman, A. (1980). *Pharmacological basis of therapeutics*. 6th edition. McMillan Publishing Company. New York.

- Roy, B.K. (2001). *Veterinary Pharmacology and Toxicology*. 1st edition. Kalyani Publishers. New Delhi. India
- Wanamaker, B.P. and Pettes, C.L. (1996). *Applied Pharmacology for the Veterinary Technician*. 1st edition. W.B. Saunders Company. Philadelphia. U.S.

SIXTH SEMESTER**Course Title: VETERINARY PROTOZOOLOGY****Course Code: VPA-324****Cr.hrs: 2+1=3****Full Marks:75****Theory: 50****Practical:25****Theory**

Major topic	Minor topics	No. of lectures
Introduction to protozoology	Introduction of protozoa and general description of protozoa. Historical account of Protozoology	1
	Free living and parasitic protozoa. Difference between protozoa and protophyta, classification of protozoan parasites	1
	Protozoon development/reproduction and life cycles	1
	Modes of transmission of protozoan parasites and immunological responses in protozoan diseases	1
	Important morphological features, multiplication and modes of transmission, pathogenesis, diagnosis, Chemo and immunoprophylaxis and general control measures of the following protozoan parasites.	
	Kala azar, Visceral and cutaneous leishmaniasis. Tropical leishmaniasis (Leishmania).	1
	Animal and Human trypanosomiasis, surra,	1
	“ “ “	1
	Bovine and avian Trichomoniasis	1
	Trichomonad abortions (Trichomonas)	1
	Blackhead in turkeys (Histomonas)	1
	Bovine amoebae (Entamoeba, Balantidium).	1
	Giardia sp	1
	Coccidia and coccidiosis (Eimeria)	1
	“ “ “	1
	Canine and Sarcocystis and Sarcocystosis	1
	Toxoplasmosis of Animal and man (Toxoplasma).	1
	Leucocytozoon sp, Ehrlichia sp	1
	Malarial Parasite of Man, Animals and Poultry (Plasmodium)	1
	“ “ “	1
	Haemoproteus	1
	Babesia and babesiosis (Babesia)	1
	“ “ “	1
	Bovine Theileriasis in tropics (Theileria)	1
	Anaplasmosis of animals (Anaplasma)	1

	General control of Haemoprotozoan diseases of exotic livestock in Nepal	1
	Recent developments in the preparation of protozoan vaccines for field use	1
Total		26

Practical

Major topic	Minor topic	No. of lectures
Fecal examination	Examination of the faecal materials for identification of intestinal protozoa	1
	Examination of the fecal materials for identification of intestinal Coccidia	1
	Examination of the fecal materials for identification of intestinal flagellates	1
Blood examination	Preparation of blood smears, their staining and examination of slides for haemoprotozoan parasites	1
	“ “ “	1
Slide preparation	Methods of collection, fixation, preservation and mounting of protozoan parasites	1
	“ “ “	1
Drug identification	Identification of drugs against the protozoan diseases	1
Slides	Identification of representative slides of protozoan parasites.	1
	" "	1
	" "	1
	" "	1
	" "	1
Total		13

Reference

- Helminths, Arthropods and Protozoa of Domesticated Animals, E.J.L. Soulsby, ELBS, and Bailliere and Classes, London.
- General Parasitology, Thomas C.Chang, Academic Press, Orlando, Florida 32887.
- Veterinary Parasitology, G.M. Urguhart *et. al.* Blackwell Science Ltd.
- Animal Parasitology, J.D. Smyth, Cambridge University Press.
- Textbook of Veterinary Parasitology, Norman D Levine, CBS Publisher and Distributor, Delhi.
- Veterinary Parasitology, G.M. Urguhart *et.al.* Blackwell Science Ltd.
- Manual of tropical Veterinary Parasitology, Published by CAB international.
- Arthropods in Livestock and Poultry Production, J.N. Lancaster, M.V.Meisch.
- Acarology, Volume I and II, D.A.Griffiths and C.E. Bowman, Holsted Press.

SIXTH SEMESTER**Course Title: GENERAL AND SYSTEMIC VETERINARY VIROLOGY****Course Code: VMC-324****Cr.hrs: 2+1=3****Full Marks:75****Theory:50****Practical:25****Syllabus with breakdown****Theory**

Major topic	Minor topics	No. of lectures
Characters of DNA and RNA	General characteristic of various families of RNA	1
	General characteristic of various families of DNA	1
DNA family	Biology, diagnosis and immunity of the following DNA family	
	Pox virus = Pox diseases of cow, Sheep, goat and fowl	1
	Iridovirus – African swine fever;	1
	Herpes virus – Pseudorabies, Malignant catarrhal fever	1
	Herpes virus –Infectious bovine rhinotracheitis, Equine abortion,	1
	Herpes virus - Marek's disease, Infectious laryngeotracheitis	1
	Adenovirus- Infectious canine Hepatitis, EDS;	1
	Papovo virus- Papillomatosis	1
	Parvo virus-Parvo virus infection of dogs	1
RNA family	Biology, diagnosis and immunity of the following RNA family	
	Orthomyxo virus-Swine, Equine & Avian influenza	1
	Paramyxovirus – Rinderpest, PPR	1
	Paramyxovirus – canine distemper	1
	Paramyxovirus- Ranikhet disease	1
	Orbo virus – African horse sickness, blue tongue	1
	Ehabdo-virus-Rabies, ephemeral fever;	1
	Corona virus-Infectious bronchitis	1
	Corona virus- transmissible gastroenteritis, neonatal calf diarrhoea virus	1
	Toga virus-Swine fever	1
	Toga virus- mucosal disease & equine encephalitis	1
	Picornavirus –FMD, deck virus hepatitis	1
	Retro virus – Avian leucosis complex.	1
	Un-classified bursal disease (Birna).	1
	Latent & Oncogenic viral infections	1
	Sheep pulmonary adenomatosis Maedia/ visna	1
	Eq. Inf. Anemia. V. (lenti)	1

Total	26
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Practical

Major topic	Minor topics	No. of lectures
	Filtration	1
	Egg inoculation	1
	Tissue culture technique	1
	Animal inclusions	
	Rinderpest	1
	FMD	1
	RD	1
	Blue tongue	1
	Rabies	1
	IB/IBD/ILT	1
	MD	1
	Other agents	1
	“ “	1
	“ “	1
	Total	13

Reference

- Veterinary Bacteriology and Virology by I.A. Merchant and R.A. Packer.
- Medical Mycology by J.W. Rippon.
- Fundamental Virology-Kinpe.
- Microbiology-Strohi.

SIXTH SEMESTER**Course Title: SPECIAL PATHOLOGY - II****Course Code: VPL-324****Cr.hrs: 2+1=3****Full Marks: 75****Theory: 50****Practical: 25****Syllabus with breakdown****Theory**

Major topic	Minor topics	No. of lectures
Introduction and Nutritional deficiencies	General introduction and pathology of nutritional deficiency diseases	1
	“ “ “	1
	“ “ “	1
Avian diseases	Inflammation, Respiratory disease complex	1
	“ “ “	1
	New-castle disease,	1
	Infectious bronchitis and Infectious laryngotracheitis	1
	Inclusion body hepatitis / hydropericardium Syndrome Egg drop Syndrome	1
	Avian Influenza	1
	Fowl pox, Reo virus infection and Chicken Infectious Anaemia	1
	Avian encephalomyelitis, Viral arthritis	1
	Infectious bursal disease	1
	Neoplastic disease: Marek's disease	1
	Neoplastic disease: Avian leucosis complex,	1
	Salmonellosis – Pullorum disease	1
	“ Typhoid and Paratyphoid	1
	Pasturellosis-Fowl cholera; Avian pseudo tuberculosis	1
	Avian mycoplasmosis, Chlamydiosis	1
	Colibacillosis, coryza	1
	Avian brucellosis; spirochetosis Botulism, Necrotic enteritis	
	Fungal infection: Aspergillosis and favus infection, Mycotoxycosis	1

	Parasitic infestation caused by: nematodes, cestodes and protozoa	1
	“ “ “	1
Miscellaneous diseases	Vices and Syndromes:FLHS,ADS,Ascites, Swollen head	1
Pathological condition of wild, zoo animals, birds and lab. animals	Common pathological conditions seen in wild and zoo animals	1
	Common pathological conditions seen in birds	1
	Pathological lesion commonly seen in laboratory animals	1
Total		26

Practical

Major topic	Minor topics	No. of lectures
Postmortem	Postmortem examination of poultry	1
	Techniques of collection and dispatch of morbid materials	1
	Writing of P.M. examination reports of important diseases	1
Diagnosis of disease	Diagnoses of diseases of poultry on the basis of symptoms, gross lesions and histopathological changes	1
	“ “ “	1
Blood and faeces examination	Clinical examination of blood of poultry and interpretation of its results.	1
	Clinical examination of faeces of poultry and interpretation of its results.	1
Gross specimens	Study of gross specimens of different infectious diseases of poultry	1
Histopathological slides	Study of gross histopathological slides of different infectious diseases of poultry	1
	“ “ “	1
Postmortem and demonstration of lesions	P.M. examination of wild animals and birds	1
	Specimens of lesions from wild animals and birds.	1
	P.M. of laboratory animals (if any) and demonstration of lesions thereof, demonstration of nutritional diseases	1
Total		13

Reference

- Veterinary Pathology CBS Publishers and Distributors, India –Ganti Sastry.
- Veterinary Clinical pathology, CBS Publishers, India. Ganti Sastry.
- Textbook of Veterinary Special Pathology-Vegad.
- Textbook of Veterinary General Pathology-Chauhan.
- Pathology of infectious diseases of domestic animals –H.V.S. Chauhan.
- Veterinary Pathology in the tropics –Mugera.

SIXTH SEMESTER**Course Title: MEAT HYGIENE AND PUBLIC HEALTH****Course Code: VPH-322****Cr.hrs: 1+1=2****Full Marks: 50****Theory:25****Practical:25****Syllabus with breakdown****Theory**

Major topic	Minor topics	No. of lectures
	Aim, objectives and role of Veterinary Public Health in modern society	1
	Health in modern society. General principles and objectives of meat inspection	1
	Food animals, Transportation of food animals	1
	Elements of meat inspection. Different components and management aspects of abattoir	1
	Methods of slaughter	1
	Conditions detected at meat inspection and their judgement	1
	Characteristics of meats of different food animals; Composition. Rigor mortis	1
	Differentiation of meat of different food animals. Emergency slaughter	1
	Disposal of unsound meat, Utilization of meat and methods of preservation	1
	Inspection of poultry eggs, fishes and game animals	1
	Meat borne diseases and methods of control.	1
	Principles of meat preservation.	1
	Examination of lymph nodes and their importance in meat inspection.	1
Total		13

Practical

Major topic	Minor topics	No. of lectures
Inspection	Inspection of meat processing plant	1
	Inspection of meat marketing centres	1
	Inspection of food service establishments	1
	Ante-mortem inspection of food animals	1
	Post-mortem inspection of food animals	1
Slaughtering	Methods of slaughtering (Demonstration at slaughter house)	1
Meat	Differentiation of meats of different food animals	1
	Isolation and identification of pathogens from meat	1
	Isolation and identification of pathogens from meat products	1
Quality of different products	Physical and bacteriological quality of meat	1
	Physical and bacteriological quality of fish	1
	Physical and bacteriological quality of eggs	1
Total		12

Reference

1. Veterinary Medicine and Human Health-Cavin .W.Schwabe.
2. Textbook of Meat Inspection –Horace Thornton.

SIXTH SEMESTER**Course Title: SHEEP AND GOAT PRODUCTION AND MANAGEMENT****Course Code: LPM-327****Cr.hrs: 1+1=2****Full Marks:50****Theory:25****Practical:25****Syllabus with breakdown****Theory**

Major topic	Minor topics	No. of lectures
Sheep	Sheep production at national state level. Importance of sheep production in national economy. Selection of sheep for mutton and fibres. Judging of the quality and conformation of body parts;	1
	Different indigenous and exotic breeds of sheep	1
	feeding and management; Sheep housing, routine health care: deworming, vaccination, breeding schedules,	1
	care in pregnancy, lambing; care of lambs, young stocks; weaning, shearing	1
	Marketing of wool and mutton, their economics of production, grading and marketing.	1
	Preparation of projects for sheep units	1
Wool	Glossaries of terms in wool industry. Growth and structure of wool fibre. Physical and chemical properties of wool	1
	Impurities in wool; factors influencing the quality of wool. Recovery of wool wax and its use.	1
Goat	Goat production at national and state levels; Goat production for profit, Selection of goats for chevon and milk; judging of the quality and conformation of body parts;	1
	Different indigenous and exotic breeds of goats, Goat feeding and management	1
	Breeding of goats, buck management, care of goat in pregnancy and kidding; rearing of kids, weaning, fattening etc	1
	Rearing sheep and goat together. Goats as leaders in grazing. Goat housing and marketing;	1
	Chevon and goat milk marketing and their economics of production. Individual and back yard goat farm management (on household surplus and hand feeding).	1
Total		13

Practical

Major topic	Minor topics	No. of lectures
Sheep	Familiarization with farm routines. Identification and selection of sheep. Handling of sheep.	1
	Dipping, Spraying, spotting sick animals, examination for parasites, administration medicine, Vaccination.	1
	Grazing/feeding sheep; farm records maintenance.	1
	Detection of heat, mating, identifying pregnant animals, Care of pregnant animals, lambing, neonatals and young stock	1
	Care of pasture. Judging sheep for wool and mutton. Shearing and grading of wool and storage	1
	Marketing of wool, mutton and live animals; Layout plans of sheep farms of different sizes; Working out economics of sheep production from the farm records	1
	Structure of wool and its differentiation from hair fibre. Determination of staple length crimps diameter and strength of wool fibre	1
	Sorting, packaging and grading of wool. Recovery of wax from wool, scoring and carbonization of wool,	1
	Visit to wool production center and woollen industries.	1
Goat	Familiarization with farm routines, handling, identification and selection of goats; Spotting sick animals examination for diseases and parasites, adm. of medicine, vaccination	1
	Detection of vices; culling. Detection of estrus, mating, care of pregnant, kidding, neonatal care, weaning and care of young stock	1
	Castration of kids. Layout plans for goat farms and backyard unit.	1
	Profit work outs; Judging of goats for chevon; practical housing and feeding of goats	1
	Goat farm records maintenance; Marketing of chevon, milk and live goats	1
	Visit to sheep and goat farms and demonstration centres; Individual goat dwells.	1
Total		15

Reference

- Goat production-S.K. Jindal.Cosma Publication, New Delhi.
- Sheep production-William Haresign, Butterworth, London.
- A Textbook of Animal Husbandry-G.C. Banerjee. Oxford and IBH publishing Co.New Delhi.

SIXTH SEMESTER**Course Title: AVIAN PRODUCTION AND MANAGEMENT****Course Code: LPM-328****Cr.hrs: 2+1=3****Full Marks:75****Theory:50****Practical:25****Syllabus with breakdown****Theory**

Major topic	Minor topic	No. of lectures
	Economic importance of poultry, development of poultry industry in Nepal,	1
	Different breeds and varieties of chicken, ducks and turkeys;	1
	Terms used in poultry science	1
	How egg is formed - structure of eggs, formation of yolk, albumen and shell;	1
	Selling of poultry and effect of culling on egg production,	1
	Incubation of hatching of eggs, selection of hatching eggs, handling and care of hatching eggs,	1
	Natural and artificial breeding, brooders.	1
	Season for breeding; different systems of housing of poultry; floor space requirements,	1
	Constructional details of poultry houses and hatcheries, cost of construction,	1
	Construction of budget poultry sheds for small, medium and large operators;	1
	Layout plans for poultry farm of various sizes	1
	Poultry equipment: incubators, brooders, debeaker, trap nests, feeders and waterers etc	1
	Care and management of chicks, pullets and cockerels	1
	Care and management of broilers and layers	1
	Feeds and feeding of broilers and layers,	1
	Poultry farm records; commercial hatcheries and its role in poultry development;	1
	Random sample tests; preparation of poultry for show; poultry judging;	1
	Disinfection of incubators, brooders, farm implements and poultry houses.	1
	Disposal of poultry wastes. Utilities of poultry manure	1
	Economy in poultry production- Cost of production of table and hatching eggs,	1

	Cost of production of broiler meat, day-old chicks	1
	Preparation of project reports for broiler	1
	Preparation of project reports for layers	1
	Preparation of project reports for hatchery	1
	Cockerel and Japanese Quail farms. Role of avian farms in a mixed farm unit.	1
	Vaccination, deworming, detecting deficiencies and combating them	1
	Total	26

Practical

Major topic	Minor topics	No. of lectures
	Handling of poultry. External body parts, Identification of species, breeds and varieties of poultry	1
	Reproductive and digestive systems of chicken	1
	Structure and composition of eggs and meat	1
	Poultry judging, selection and selling of poultry	1
	Candling of eggs for evaluation of quality, presence of blood and meat spots etc	1
	Measuring the strength of eggs, grading of eggs and management of incubators	1
	Sexing of chick, brooding of chicks, Feeders, waterer, trap nests and poultry farm and hatchery equipments	1
	Different systems of housing and layout plans for poultry farms of different sizes	1
	Feeds and feeding of broilers and layers, systems of feeding	1
	Slaughter and dressing of poultry, different methods of preservation of eggs and meat;	1
	Health care and management of chicks, ducklings and turkey,	1
	care and management of broilers and layers during summer and winter	1
	Record keeping of Poultry Farm (including accounts)	1
	Preparation of feasibility reports for small and medium poultry farms	1
	. Preparation of projects reports for the small and medium poultry farms.	1
	Model scheme for a large poultry farm.	1
	Total	16

Reference

- Poultry production-R.A.Singh Kalyani publishers, New Delhi.
- Poultry husbandary-Morley A.Jull. Tata Mc Graw –Hill Publishing Co. Ltd. New Delhi.

SIXTH SEMESTER**Course Title: ABATTOIR PRACTICES AND ANIMAL
BY-PRODUCTS TECHNOLOGY****Course Code: LPT-322****Cr.hrs: 1+1=2****Full Marks:50****Theory:25****Practical:25****Syllabus with breakdown****Theory**

Major topic	Minor topic	No. of lectures
	Organization, layout and management of slaughterhouses	1
	Pre-slaughter care	1
	Handling and transport of meat animals.	1
	Judging and grading of live meat animals	1
	Ante- mortem and postmortem examination	1
	Different slaughtering and dressing techniques followed for various kinds of meat animals in Nepal and abroad.	1
	Chilling, ageing and evaluation of dressed carcasses.	1
	Disposal of animals suffering from notifiable diseases and condemned parts	1
	Utilization of slaughter house byproducts	1
	Organic wastes available through the animal industries, fallen and slaughtered affluents and glandular byproducts.	1
	“ “ “	1
	Optimal harvesting of hides (ante-mortem care, proper skinning, salting, stacking and preservation	1
	“ “ “	1
Total		13

Practical

Major topic	Minor topics	No. of lectures
Methods of slaughter	Ritual and Humane steps (stunning, slaughtering out of sight of live animal, isolation) in slaughter	1
	“ “ “	1
Food animals	Flaying and dressing of food animals	1
Meat animals	Judging of meat animals and carcass evaluation	1
	Slaughtering and dressing of different kinds of meat animals	1

Meat yield	Estimation of meat yield and dressing percentage	1
Slaughter house	Maintenance of slaughter houses and their sanitation	1
	Yield estimation and utilization of certain slaughter house by-products.	1
Fermentation	Identification, culture, induced fermentation by non-toxin producing harmless microorganisms.	1
Visit	Visit to leather processing unit to study their layout and organization, collection of samples	1
	Visit to slaughter houses to study their layout and organization, collection of samples	1
	Visit to meat plants to study their layout and organization, collection of samples	1
	Visit to bacon factory to study their layout and organization, collection of samples	1
Total		13

Reference

- Poultry product technology-J. Mountrey. The Avi. Publishing Company Inc.
- Meat Hygiene-ELBS.
- Wool Production and Management. R.A. Singh, Kalyani Publishers.

SEVENTH SEMESTER

Course title: Livestock Production and Management (Cattle and Buffalo Production and Management)

Course code: LPM-419

Cr.Hrs: 1+1=2

Full marks: 50

Theory:25

Practical:25

Syllabus with breakdown

Theory

Major topic	Course breakdown	Lecture
Introduction	Introduction, census and status of indigenous and exotic breeds of cattle and buffaloes. Problems of international and national prospectus of dairying.	1
Buffalo Production	Origin and distribution of buffaloes, Economic traits, their selection and management	1
	Breeds of buffaloes	1
	Feeding, care and management of pregnant, milch, dry, heifer and newborn calf.. Feeding and management of breeding bull and working bullock.	1
	Reproduction and breeding principles of buffaloes. Preparing and training of bulls for artificial breeding	1
	System of housing and preparing animals for show. Health & hygiene of buffalo.	1
Cattle Production	Origin and distribution of cattle. Economic traits of cattle, their selection and management. Breeds of cattle	1
	feeding care and management of newborn calf, heifer, pregnant, milching and dry animals. Feeding and management of breeding bulls and working bullocks.	1
	Reproduction and breeding principles of cattle. Housing systems and preparing animals for show Health & hygiene of cattle.	1
Cattle & Cattle & Buffalo Management	Constructional details of dairy cattle & buffalo housing and dairy farms	1
	Clean milk production, method of milking (merits & demerits). Routine dairy farm operation Account and recording system.	1
	Development of dairy milk supply schemes in the country. Lay out plans for back yard and commercial scale dairy farm. Factors affecting quality and quantity of milk operation of mixed dairy farm	1
	Economics of dairy farming in urban and rural areas. Hygienic milk production system, dairy wares and equipments.	1
	Total	13

Practical

Major topic	Course breakdown	Lecture
	Identification & familiarization with various breeds of dairy animals	1
	Lay out plans for a dairy farm. Economic calculation and estimation methods for cost effective ness in dairy farm.	1
	Casting restraining of dairy animals. Familiarization of ear rings nose rings, mouth guaze. Tattooing, branding and tagging	1
	Castration and dehorning.	1
	Familiarization of milking system and equipments	1
	Physical and chemical methods of examination of milk for its quality Assessments for microbial quality of milk.	1
	Operation, examination and analysis of farm records, ledger, and cashbooks. Preparation and examination of balance sheets.	1
	Feeding, housing, care and management of young and adult animals	1
	Selection and culling of productive and unproductive animals	1
	Vaccine and Vaccination Program	1
	Administration of antihelminthic for parasite control program for dairy animals	1
	Performance evaluation of dairy herds.	1
	Herd health management	1
	Total	13

Reference

- Cattle Management - Cheryl May. Roston Publishing Company, Inc. Roston, Virginia.
- Textbook on Buffalo Production - C.K. Rajhan, N.N. Pathak, Vikas Publishing House Pvt.Ltd, New Delhi.
- Principle & Practices of dairy farm management - Jagdish Prasad
- A text book of animal husbandry- G.C. Banerjee.

SEVENTH SEMESTER**Course Title: Veterinary Public Health(Zoonoses and Human Health)****Course Code: VPH-413****Cr.hrs: 1+1=2****Full Marks:50****Theory:25****Practical:25****Syllabus with breakdown****Theory**

Major topics	Title:	Lecture No.
	Definition, and objectives and Classification of zoonosis (Direct, Cyclo, meat, Sporozoonosis etc.)	1
	Concept of one health	1
	Role of domesticated pets, various wild and cold blooded animals in transmission of zoonotic disease.	1
	Role of domesticated pets, various wild and cold blooded animals in transmission of zoonotic disease.	1
	Study of important zoonotic disease of the region	1
	Study of important zoonotic disease of the region	1
	Study of important zoonotic disease of the region	1
	Study of important zoonotic disease of the region	1
	Methods of prevention, control and eradication of zoonotic disease	1
	Methods of prevention, control and eradication of zoonotic disease	1
	Methods of prevention, control and eradication of zoonotic disease	1
	Socio-economic condition and Human health zoonosis	1
	Socio-economic condition and Human health zoonosis	1
	Total	13

Practical

Major Topics	Title:	Lecture No.
	Isolation and identification of important pathogens of zoonotic importance	1
	Isolation and identification of important pathogens of zoonotic importance	1
	Isolation and identification of important pathogens of zoonotic importance	1
	Sero-epidemiological studies of important zoonotic disease by FAT, HI, CPT etc	1
	Sero-epidemiological studies of important zoonotic disease by FAT, HI, CPT etc	1
	Sero-epidemiological studies of important zoonotic disease by FAT, HI, CPT etc	1
	Sero-epidemiological studies of important zoonotic disease by FAT, HI, CPT etc	1
	Study of rural environment and health status of rural community	1
	Study of rural environment and health status of rural community	1
	Visit to primary health centers to study the common condition of rural population	1
	Visit to primary health centers to study the common condition of rural population	1
	Total	11

References

- Veterinary Medicine & Human Health .Cavin W. Schwabe.
- Parasitic Zoonoses - S.C. Pacija
- Veterinary medicine - Blood, Radostits *et. al.*,

SEVENTH SEMESTER**Course title: Veterinary Public Health & Environmental Hygiene****Course code: VPH - 414****Cr.Hrs: 1+1=2****Full marks: 50****Theory:25****Practical:25****Syllabus with breakdown****Theory**

Major Topic	Title	Lecture No.
Water	• Sources of water supply and their quality.	1
	• Sources of contamination of water and prevention	1
	• Bacteriology of water and air	1
	• Purification and sanitation of water.	1
Sewage and sanitation	• Disposal of sewage and farm refuse, their relation with animal and animal health respectively.	1
	• Sanitation of animal houses	1
Diseases	• Method of prevention and control of air disease of man and animal.	1
	• Method of prevention and control of water disease of man and animal.	1
Pollution	Atmospheric pollution and method of control.	1
	Stray animal control, fallen animal and environment.	1
	Radiation drug etc. as a source of pollution.	1
	Possibilities of recycling farm surplus/wastes etc.	1
	Sources of air pollution in animal houses and its effect on animal houses and its effect on animal health and production.	1
	Total	13

Practical

Major Topic	Title	Lecture No.
Water	<ul style="list-style-type: none"> • Qualitative chemical examination of water, impurities and pollution of water. • Estimation of total hardness in water. 	1 1
Environment	<ul style="list-style-type: none"> • Estimation of air temperature. • Estimation of relative humidity. • Pathogenic organisms in air, water, and farm environment and application of disinfectants. • Demonstration of air purification plant. 	1 1 1 1
Sanitation	<ul style="list-style-type: none"> • Sewage disposal and treatment systems • Carcass/fallen animal disposal methods. • Study of different ventilation system . • Sampling of water for bacteriological and chemical examination. • Coliform test of determine the potability of water. • Visit to recycling plants. 	1 1 1 1 1 1
	Total	13

Reference

- Veterinary Medicine and human health- Cavin W. Schwabe
- Fundamentals of animal hygiene and epideminology - Thapliyal

SEMESTER VII**Course title: Livestock Product Technology(Meat & Meat Products Technology)****Course code: LPT-413****Cr.Hrs: 1+1=2****Full Mark: 50****Theory : 25****Practical : 25****Syllabus with breakdown****Theory**

Major topic	Title	Lecture No
	Development of meat industry, structure, composition, nutritive value, postmortem changes and eating quality of meat tissues	1
	Principles of various preservation techniques like chilling, freezing, curing, smoking, thermal processing, canning and irradiation, meat cutting and packaging	1
	Principles of various preservation techniques like chilling, freezing, curing, smoking, thermal processing, canning and irradiation, meat cutting and packaging	1
	Microbial and other deteriorative changes I meat and their identification standards and quality control, measures adopted for meat and meat products in Nepal and aboard	1
	Meat food order-eating quality of meat-sensory evaluation of meat food products-fraudulant substitution of meat and its recognition-physical ,chemical and biological means for differentiation of meat	1
	Meat food order-eating quality of meat-sensory evaluation of meat food products-fraudulant substitution of meat and its recognition-physical ,chemical and biological means for differentiation of meat	1
	Chemical composition and nutritive value of buff,chevon,mutton,chicken,pork and fish meat etc	1
	Pre-slaughter care, handling and transport of meat animals. Antemortem and post-mortem examination of dressed poultry	1
	Slaughtering techniques used for various types of meat animals. Preservation of poultry meat by chilling, freezing, curing ,smoking and irradiation	1
	Preparation of poultry products. NSI and other legal standards for poultry and poultry products	1
	Utilization of poultry industry by-products. Structure ,composition, nutritive value of eggs.	1
	Microbial spoilage of eggs. Preservation and maintenance of eggs	1
	Principles involved in preparation of different poultry based food. Role of meat poultry products in Human nutrition	1
	Total	13

Practical

Major Topic	Title	Lecture No.
	Preparation of different meat cuts.	1
	Estimation of meat bone ratio, chilling and ageing of meat.	1
	Preservation and packaging of meat.	1
	Preparation of certain meat products	1
	Estimation of microbial load of meat.	1
	Identification of deteriorative changes in meat and meat products	1
	Slaughtering and evisceration of different kinds of birds	1
	Estimation of dressing percentage and yield	1
	Grading of dressed chicken/poultry	1
	Preparation of ready to eat meat/poultry products	1
	Microbiological sampling of meat , poultry products and eggs	1
	Preparation of certain poultry by-products	1
	Candling ,grading and preservation of shell eggs	1
	Total	13

Reference

- Meat Hygiene - By ELBS
- Poultry Product Technology - J. Mountrey. The Avi. Publishing Company Inc.
- Text book of meat inspection - Horace Thrnto

SEVENTH SEMESTER**Course title: Surgery and Radiology(General Surgery and Anaesthesiology)****Course code: VSR-411****Cr.Hrs: 2+1=3****Full Mark: 50****Theory : 25****Practical : 25****Syllabus with breakdown****Theory**

Chapter	Title	Lecture No
General Surgery	Introduction,history,classification and development of Veterinary Surgery	1
	General surgical principles, pre-operative and post operative considerations	1
	Importance of sutures, suturing materials and different knots	1
	Asepsis-antisepsis, their application in Veterinary surgery, sterilization of surgical materials and instruments	1
	Inflammation, abscess, tumors, cysts, hernia etc and their treatment.	1
	Wound; classification,symptoms,diagnosis and treatment, complications and their preventions and remedies	1
	Haemorrhage and haemostasis, shock haematoma.	1
	Necrosis, Gangrene, burn and scald , sinus and fistula	1
	Surgical infections and their prevention and their management	1
	Surgical affections of muscles, artery, and vein.	1
	Fracture and dislocation and other affections of joints	1
Anesthesiology	History and Importance of anaesthesia in Veterinary Surgery	1
	General considerations, types of anaesthesia..	1
	Definition and selection of anesthetic and methods of administration.	1
	Preparation of the patient for anaesthesia . Local and regional anaesthesia (surface anaesthesia ,infiltration and field block)	1
	Narcosis and premedication in domestic animals	1
	General anaesthesia , definition , methods of inducing general anesthesia, anesthetic drugs	1
	Parental inhalation anaesthesia , its method of administration in horse, cattle and dog	1
	Intravenous anesthesia ,dissociative anaesthesia	1
	Electro anaesthesia, accupunture, hypothermia etc(only awareness)	1
	Anesthetic complications emergencies and their remedies	1
	Chemical restraint of wild/zoo animals	1
	Anaesthesia of lab animals	1

	Total	23
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Practical

Chapter	Title	Lecture No.
General Surgery	Introduction to the layout of operation theatre, common equipments, surgical instruments	1
	Restraint ,positioning, bandaging , catheterization etc	1
	Operation theatre routines, preparation of surgical pack, sterilization etc	1
	Familiarization with various suture materials, sutures	1
	Tying surgical knots, double hand, single hand etc,	1
	Tension sutures, bowel and uterine sutures	1
	Demonstration of surgical operation-control of hemorrhage , suturing etc	1
	Administration of drugs by different routes and different types of injections	1
	Anesthesiology	Familiarization with anesthetic apparatus. Endotracheal devices, laryngoscope, gadgets for monitoring
Administration of inhalant anesthetics by various methods small animals		1
Methods of local infiltration (Ring Block, Diamond block, T-block, inverted L-block)		1
Epidural and Para vertebral analgesia in cattle		1
Preparation ,calculation of dose and conduction of anesthesia in large animals		1
Regional block, intravenous retrograde regional anaesthesia-cattle		1
Demonstration and monitoring of general anaesthesia and the management of anesthetic emergencies. Use of artificial respiration etc		1
Chemical restraint of lab and wild animals(Visit to wild animal facility)		1
	Total	16

Reference

- Dolor's Veterinary surgery by J.J. O'conner (4th Edition)
- Essentials of Veterinary surgery by A. Venugopalan
- Veterinary Surgical Techniques (1st edition) By Amresh Kumar
- Veterinary surgery By E. R. Frank

SEMESTER VII

Course Title: Veterinary Epidemiology(Veterinary Epidemiology & Preventive Veterinary Medicine)

Course Code: VEP-411

Cr.hrs: 1+1=2

Full Marks:50

Theory:25

Practical:25

Syllabus with breakdown

Theory:

Major topics	Title	Lecture No.
Epidemiology	Definition, aim, objectives and applications of epidemiology and preventive medicine	1
	Ecological concepts of epidemiology	1
	Disease process and its spread	1
	Pattern of disease distribution in the community	1
	”	1
	Types of epidemiological studies e.g. case control, cohort and cross sectional	1
	”	1
	”	1
	Laws regulating emerging and spreading disease of animals and birds.	1
	Office International Epizootic, its categorization of disease that are transmissible and other regulations.	1
	Investigation of an epidemic, prevention control and eradication of diseases	1
	”	1
	Regulations, regulating handling, import and export of biomaterials.	1
	Total	13

Practical :

Major Topics	Title:	Lecture No.
	Visit to primary health centers/ infectious disease hospital/ Vet hospital	1
	Estimation of Odds ratio, relative risk and prevalence	1
	„	1
	Visit to organized farms	1
	Sampling technique and Collection of data for epidemiological investigation	1
	Processing and analysis of data	1
	Processing and analysis of data	1
	Laboratory investigation related to epidemiological studies and its correlation	1
	Laboratory investigation related to epidemiological studies and its correlation	1
	Data collection Project work	1
	Data collection Project work	1
	Total	11

References :-

- Veterinary Epidemiology - Martin, Meek, Williberg.
- Fundamental of animal hygiene and epidemiology – Thapliya
- Meat Hygiene - ELBS.
- Meat Laws - Published by TLDP

SEVENTH SEMESTER

**Course Title: Veterinary & Animal Husbandary Extension (Extension Techniques
in veterinary Practice and Livestock Production**

Course Code: AHE-413

Cr.hrs: 1+1=2

Full Marks:50

Theory:25

Practical:25

Syllabus with breakdown

Theory

Major Field	Topics	Lecture No.
Marketing Methods	Marketing Methods of Livestock Production Urban Societies	1
	Marketing Methods of Livestock & Livestock Product in Rural Societies	1
	Distribution Of Livestock & Livestock Product in Rural & Urban Societies	1
Various Kinds of Farming	Large Scale Farming of Various Livestock Breed	1
	Small Scale Farming of Various Livestock Breed	1
	Mixed Farming of Various Livestock Species	1
	Co-Operative and Collective Farming Of Livestock	1
Economic & Role of Cooperative	Economic Principles Underlying Co-Operative Societies	1
	Role & Progress of Co-Operative Milk Activities in Nepal	1
Planning & Programme	Animal Husbandry Planning and Programms	1
	Animal Husbandry Administration	1
	Integrated Rural Development Programme in Animal Husbandry.	1
	Brief Description About The Programme of First, Second, Third Livestock Development Programme & Community	1
	Livestock Development Programme & Strength Emirs of Veterinary Livestock Development Programme	1
	Extension Programmes in Goat, Sheep, Buffalo, Cows, Poultry, Rabbit and Pig	1
	Total	15

Practical

Major Field	Topics	Lecture No.
Audio-Visual Equipments	Use and Principles of Overhead Projector	1
	Use and Principles of multimedia	1
	Use and Principles of Slide-Projector	1
	Use and Principles of Tape- Records	1
Principles Of Construction	Use and Principles of Poster Making	1
	Use and Principles of Flash Card Making	1
Use Of Literature In Extension	Circular Letter	1
	Advisory Letters, Leaf Lets, Pamphlets, Folders etc	2
Group Discussion	Awareness Campaigns on Different Veterinary and Animal Husbandry Practices Such As:- Sigh of Diseases Control of Tympanitis	1
	Drenching of Animals Branding of Animals Vaccination of Animals Controlling of Ecto-Parasites	1
	Clean Milk Production, Pail Feeding of Calves Disbudding, Branding Use of Horn Cauterisation Sexing and Culling of Birds, Preservation of Eggs First Aids for Minor Wounds, Disinfections of Barns	1
	Awareness Campaigns on Timely Artificial Inseminations Cause of Infertility	1
	Checking & Care of Pregnancy Preparation of Feed, Feeding Schedules,	1
	Deworming Vaccination Routines, Preventive Hygiene	1
	Important of Diagnosis	1
	Total	16

Reference

- Principle of extension Education- B.B.S. Dangol, Niraj Narayan Joshi

SEVENTH SEMESTER**Course Title: Veterinary Pharmacology & Toxicology(Chemotherapy)****Course Code: VPT-413****Cr.hrs: 2+1=3****Full Marks: 75****Theory: 50****Practical: 25****Syllabus with breakdown****Theory**

Major Topics	Minor Topics	Lecture No.
	Drug resistance and Multiple Drug Therapy	1
	Classification; General principles in antibacterial chemotherapy,	1
	Sulphonamides and their combination with trimethoprim;	1
	Sulfones; Nitrofurans	1
	Penicillins and Cephalosporins	1
	Aminoglycosides	1
	Tetracyclines	1
	Chloramphenicol; Polypeptides	1
	Fluroquinolones	1
	Antituberculosis agents	1
	Miscellaneous agents; Methelamine, Macrolides etc.	1
Antifungal agents	Topical and systemic agents including antifungal antibiotics	1
Anthelminthics	Drugs used against Cestodes	1
	Drugs used against Trematodes	1
	Drugs used against Nematodes	1
	Drug tolerance	1
	Broad spectrum Anthelminthics	1
Ectoparasidal agents	Drugs used against external parasites	1
Antiprotozoal agents	Drugs used in Trypanosomiasis and Malaria	1
	Drugs used in Theileriasis, Babesiasis and Anaplasmosis	1
	Drugs used in Coccidiosis	1
	Drugs used in Amoebiasis, Giardiasis, Trichomoniasis etc.	1
Antiviral and anticancer agents	Different antiviral and anticancer agents	1
Antiseptics and disinfectants	Antiseptics and Disinfectants used in veterinary practice	1
Hormones	Hormone stimulating/ inhibiting drugs; antagonists; Hypoglycemic agents	1
	Prostaglandins; Oxytocic and Tocolytic drugs: Galactagogues, Anabolics, Corticosteroids.	1

Indigenous drugs	Source of alkaloids, glycosides, resins, gums, tannins, fixed and volatile oils	1
	Plant drugs with proven pharmacological and therapeutic efficacies in various animal and human ailments;	1
	Popular indigenous drugs (antiseptics, antifungals, anthelminthics, arthropode repellants)	1
Total		29

Practical

Major Topics	Minor Topics	Lecture No.
Demonstration of various chemotherapeutic agents and their forms	Demonstration of antibacterial agents and antibiotics.	1
	Demonstration of anthelmintics and ectoparasidal agents.	1
	Demonstration of antifungal, antiprotozoal agents, antiviral and anticancer agents.	1
	Demonstration of antiseptics and disinfectants.	1
	Demonstration of hormones and indigenous drugs.	1
Estimation of the antibacterial agents and antibiotics	Estimation of Sulphonamides in water and blood of animals or birds.	1
	Estimation of Nitrofurans in water and blood of animals or birds.	1
	Estimation of Penicillins in water and blood of animals or birds.	1
	Estimation of Tetracyclines in water and blood of animals or birds.	
Antibiotic sensitivity test	Bacterial sensitivity test for different chemotherapeutic agents.	1
Pharmacy Preparations	Preparation of Potassium permanaganate solution, Lugol's iodine solution and Trepan blue solution.	1
	Preparation of Gentian violet solution, Tincture Iodine, Benzoic co.	1
	Preparation of Boric acid ointment, Zinc oxide ointment, ointment of Salicylic acid with Benzoic acid etc.	1
	Total	13

Reference

- Jones Veterinary Pharmacology & Therapeutics-Booth Nicholas H. & Mc Donald Leslie E.

Syllabus

B.V.Sc.& A.H

- Veterinary Applied Pharmacology & Therapeutics-Brander G.C., Pugh D.M., Bywater R.J., Jenkin W. L.
- Antimicrobial Therapy in Veterinary Medicine -F. Prescott John & Desmond J. Baggot.
- Veterinary Pharmacology & Therapeutics-Adams.

SEVENTH SEMESTER**Course Title: Veterinary Biochemistry(Veterinary Clinical Biochemistry)****Course Code: VBC-414****Cr.hrs: 1+1=2****Full Marks: 50****Theory : 25****Practical : 25****Syllabus with breakdown****Theory**

Major Topics	Minor Topics	Lecture No.
A. Biochemistry process in conditions of health & diseases	Biochemistry of Respiration and acid base balance.	1
	Biochemistry of renal function and acid base balance.	1
	Biochemistry of stress and shock.	1
	Biochemistry of digestive disorders.	1
	Detoxification in the body; the metabolism of foreign compounds.	1
B. Biochemistry of Hormones (Structure and Metabolic roles)	Thyroxine, parathyroid hormone	1
	Insulin & Glucagon. Epinephrine & nor-epinephrine.	1
	Glucocorticoids & Mineralocorticoids. Testosterone & Estrogen.	1
	Somatotropin. Oxytocin & Vasopressin.	1
C. Diagnostic biochemistry	Role of Blood sugar as an aid to diagnosis.	1
	Role of ketone bodies as an aid to diagnosis.	1
	Role of blood urea nitrogen & uric acid as an aid to diagnosis.	1
	Role of Enzyme for detection tissue affection/organ affections (Scope & Limitations).	1
D. Immunochemistry (Nature of antigen & antibody)	Antigens, antigenic determinants.	1
	Structure of Antibodies.	1
	Immunopotency & various factors influencing immunopotency.	1
Total		14

Practical

Topics	Lecture No.
Biochemical estimation of plasma proteins.	1
Biochemical estimation of plasma proteins.	1
Urine analysis.	1
Urine analysis.	1
Estimation of blood sugar.	1
Estimation of serum total cholesterol.	1
Serum Bilirubin determination.	1
Blood urea estimation.	1
Glucose tolerance test.	1
Estimation of SGOT	1
Estimation of SGPT	1
Analysis of Transudates	1
Analysis of Exudates	1
Total	13

References

- Principles of Biochemistry-Lehninger, Nelson & Cox, CBS Publication, 1993.
- Textbook of Biochemistry with clinical correlations Thomas M. Delvin, Wiley Liss, Inc, 1997.
- Medical Biochemistry-Bhagwan
- Principles & Techniques of Practical Biochemistry-Wilson & Walker, Cambridge University Press 1975

EIGHTH SEMESTER**Course Title: VETERINARY TOXICOLOGY****Course Code: VPT-424****Cr.hrs: 2+1=3****Full mark:75****Theory:50****Practical:25****Syllabus with breakdown****Theory**

Major topic	Minor topics	No. of lectures
General Toxicology	Definition and scope of toxicology.	1
	Source of poisoning; mode of action of poison	1
	Factors modifying the toxicity.	1
	Collection, preservation & dispatch of materials for chemical analysis.	1
	Diagnosis of poisonings, Line of treatment of the poisoned cases and identification of some commonly used antidotes.	1
Toxicity caused by metals and non metals	Arsenic, Lead and Mercury.	1
	Copper, Selenium and Phosphorus.	1
	Nitrates and Nitrites.	1
	Common Salt and Fluorosis.	1
Plant toxicity	Cyanogenetic plants, Abrus, Jowar.	1
	Lantern, Ipomoea and Kanail.	1
	Datura, Nux Vomica and Castor.	1
	Selenium-Containing Plants and Oxalate producing Plants.	1
Toxicity caused by commonly used drugs	Tranquilizer, Sedatives, Hypnotic	1
	Analgesics, Anthelmintics, Antibiotics, Antibacterials.	1
	Antihistaminics, Antiseptics, and Disinfectants.	1
	Cocciostats, Digitalis, Purgatives..	1
	Quinuronium Derivatives, Hormones, Vitamins, CNS Stimulants.	1
Toxicity caused by Agrochemicals	Insecticides, Including Organosphosphates and Carbamates.	1
	Chlorinated Hydrocarbons.	1
	Herbicides.	1
	Rhodenticides.	1
Venomous bites and stings	Snake, Toad, Spiders.	1
	Scorpion, Bee and Wasp Stings.	1
Toxin	Mycotoxins, Aflatoxins, Ergot,	1
	Bacterial Toxins, Botulinastoxin.	1
Environmental toxicity	Air pollutants and water pollutants.	1
	Food toxicants.	1

	Radiation hazards and toxicity.	1
	Toxicity caused by food additives and preservatives.	1
Total		30

Practical

Major topic	Minor topics	No. of lectures
Demonstration of toxicity of commonly used drugs in animals	Antibacterial, Antibiotics, Anthelmintics, Coccidiostat	1
Demonstration of toxic plants	Demonstration of toxic weeds and plants.	1
Detection of toxic metals and non-metals	Detection of Arsenic. Antimony	1
	Detection of Lead., Mercury.	1
	Detection of Nitrates And Nitrites.	1
	Detection of Fluoride.	1
Identification of antidote & their use in toxicological cases.	Organophosphate poisoning, cyanide poisoning	1
Diagnosis of poisonous cases by lab findings.	Collection of sample , its preservation and dispatch of materials for chemical analysis.	1
Detection of plant constituents having toxicological significance	Detection of Alkaloids.	1
	Detection of Glycosides.	1
	Detection of Tannins and Resins.	1
Demonstration of toxicity caused by insecticides	Demonstration of insecticide toxicity and their treatment.	1
Demonstration of therapeutic index	Calculation of LD50 and ED50.	1
Total		13

Reference

- Jones Veterinary Pharmacology and therapeutics by Booth Nicholas H. and Mc Donald Leslie.
- Veterinary Applied Pharmacology and Therapeutics by Brander G.C; Pugh D. M., Bywater R.J. Jenkins W.L.
- Medicinal plants of Nepal by HMG , Nepal
- Pharmacology and Therapeutics in the Millenium by Gupta.
- Veterinary Toxicology by Clarke, E.G.C and Myra L. Clarke.
- Veterinary Toxicology by Garg

EIGHTH SEMESTER**Course Title: VETERINARY GYNAECOLOGY AND OBSTETRICS****Course Code: VOG-421****Cr.hrs: 2+2=4****Full Marks:100****Theory:50****Practical:50****Syllabus with breakdown****Theory**

Major topic	Minor topics	No. of lectures
Female genitalia	Introduction, development of female genitalia and description of pelvis in domestic animals .	1
Reproductive physiology	Growth, puberty, sexual maturity in relation to reproduction.	1
	Role of hormones in various phases of reproduction in females.	1
	Symptoms of oestrous and oestrous and oestrous cycle in domestic animals and factors affecting oestrous cycle.	1
	Palpation of genital organs for changes during oestrus cycle	1
	Synchronisation of oestrus cycle; ovulation.	1
	Transportation of sperms; fertilization and attachment; development of foetus.	1
	Foetal membranes of placenta. Types and function of placenta.	1
	Duration and stages of gestation in domestic animals.	1
	Superfoetation and superfecundation. Superovulation and embryo transfer.	1
	Abnormalities of fertilisation and foetal development.	1
Pregnancy diagnosis	Pregnancy examination - physical, biological, chemical, hormonal, ultrasonic and radiographic methods.	1
	Differential diagnosis of pregnancy.	1
Disease and accidents during gestation	Prolonged gestation; premature birth, early embryonic mortality, abortions in domestic animals, causes and treatment.	1
	Intrauterine death of foetus; mummification; maceration, pyometra.	1
Fertility, infertility and sterility	Functional infertility, anoestrus, ovarian hypoplasia, cystic ovary, adrenalvirlism.	1
	Fertilization, failure and repeat breeding.	1
	Infectious infertility. Specific and non specific infections affecting genital organs.	1
	Sexual health control and heard reproductive health program.	1
	Antepartum fetal membrane, twins and multiple birth, ectopic pregnancy.	1
Parturition in domestic animals	Causes and stages of parturition. Expulsion and retention of after birth.	1
	Parturition hygiene, care and management of new born and dam. Udder health care.	1

Post partum diseases and complications	Cervicovaginal prolapse, uterine prolapse.	1
	Vaginitis, cervicitis, metritis, pyometra.	1
	Postpartum paraplegia, milk fever.	1
	Clinical uses of hormones and prostaglandins.	1
Dystocia	Intrauterine presentation of foetus, eutocia, dystokia. Types of dystokia.	1
	General handling of dystokia. Diagnosis and treatment of dystokia cases.	1
	Obstetrical operations. Mutation and forced extractions. Fetotomy and caesarian section.	1
Total		29

Practical

Major topic	Minor topics	No. of lectures
Gynaecology	Study of female genitalia.	1
	Palpation technique.	1
	Palpation technique.	1
	Heat detection in farm animals.	1
	Heat detection in companion animals.	1
	Collection and examination of vaginal mucus by various techniques.	1
	Pregnancy diagnosis	1
	Differential diagnosis of pregnancy.	1
	Use of gynaecological instruments and appliances.	1
	Evaluation of female animals for breeding purpose.	1
	Sexual Health control.	1
	Life history card for the female.	1
	Recording system for reproductive performance.	1
Obstetrics	Study of pelvis.	1
	Pelvimetry.	1
	Use of obstetrical instruments.	1
	Manipulation of fetal malpresentation in Phantom boxes.	1
	Manipulation of fetal malpresentation in Phantom boxes.	1
	Attending cases of normal parturition.	1
	Attending cases of normal parturition.	1
	Fetotomy.	1
	Epidural anesthesia in obstetrical practices.	1
	Approach to obstetrical cases.	1
	Treatment of obstetrical cases.	1
	Treatment of obstetrical cases.	1
	Post operative care of obstetrical cases.	1
Total		26

Reference

- Veterinary Obstetrics and Genital Diseases-Stephen J . Roberts
- Veterinary Reproduction and Obstetrics-G. H Arthur.
- Reproduction in Farm Animals -E.S.E. Hafez
- Reproductive Physiology of Mammals and Birds-A.V. Nalbandov.
- Physiology of Reproduction and AI in Cattle-Salisbury G.W. and N. L. Yendermare.
- Reproduction in Farm Animals-Asdell
- Animal Reproduction Principles and Practices -A.M.Sorenson Jr.
- Reproduction in Farm Animals-H.H Cole and P.T.Cupps.
- Artificial Insemination of Farm Animals-Enos J. Perry.

EIGHTH SEMESTER**Course Title: RADIOLOGY, REGIONAL AND CLINICAL SURGERY – I****Course Code: VSR-422****Cr.hrs: 2+2=4****Full Marks:100****Theory: 50****Practical:50****Syllabus with breakdown****Theory**

Major topic	Minor topic	No. of lecture.
X-ray	Brief historical backgrounds of invention of X-ray scope, history and development of Veterinary Radiology.	1
	Production and properties of X-rays.Factors influencing production of radiograph (radio-graphic factors, geometric factors, photographic factors) density, detail and contrast.	1
	X-ray accessories filters, restrictors, collimator, grid etc. X-ray film and its processing.	1
	Intensifying screen its use, advantages and disadvantages. Fluoroscopy	1
Radiography	Principle of viewing and interpreting X-ray films. Classification of radiographic lesions	1
	Contrast Radiography – classification, materials used, indications and contra-indications.	1
Radiation	Biological effects of radiation; measurement of radiation; radiation hazards and their prevention by adoption of safety measures.	1
	Principles of radiation therapy; Isotopes and their uses in diagnosis and therapy.	1
Ultrasonography	Principle of ultrasonography in veterinary practice.	1
Therapy	Principle of physical therapy, its classification, scope and limitation.	1
	Mechanisms, applications, indications and contra-indications of medical galvanism and other electrical stimulations for diagnosis and therapy.	1
	Mechanisms, applications, indications contra-indications of and cold and heat therapy, massage, hydrotherapy, infrared and ultraviolet therapy.	1

	Mechanisms, applications, indications and contra-indications of short wave, microwave, diathermy and ultra sonic therapy.	1
Affections of the lips and cheek and their treatment.	Affections of the lips and cheek and their treatment.	1
Affections of tongue and their treatment	Strangulation, smooth tongue Ranula, snake bites	1
	Trauma, gangrene, sublingual abscess, glossoplegia, actinobacillosis. Milk suckling	1
Affections of the horn and their treatment:	Avulsion of the horn, broken horn. Horn cancer	1
	Fracture of the horn and fistula in horn. Debudding and amputation of the horn.	1
Affections of the teeth and their treatment:	Congenital abnormalities, irregular molars (shear mouth, sharp teeth, wave form mouth, stepformed mouth, smooth mouth, premature water mouth)	1
	premature water mouth; dental tartar and dental caries, dental tumour(odontoma, adamantinoma), periodontal disease, Bishoping	1
Affections of the palate and treatment	Lampas, cleft palate, palatine tumours, protusion, and strangulation of soft palate.	1
Affection of nose and treatment:	Atheroma, nasal polyps, resection of the nasal septum, necrosis of the turbinates and parasites in the nasal chambers.	1
	Guttural pouch, empyema, chondritis, <u>tympanitis</u> , sinusitis, pus in the sinus.	1
Affections of salivary glands and their treatment	Trauma, sialoliths, salivary cysts, salivary fistula, neoplasm, sub-parotid abscess.	1
Congenital affections of lower jaw and treatment	Paralysis of lower jaw gnathitis, lymphadenitis of jaw, injuries and fracture of hyoid bone and crib biting.	1
Affections of the ear and their treatment	Examination of ear, haematoma of ear, ear cropping, necrosis of conchal cartilage:	1

	Drooping ears, ulceration of conchal cartilage, conchal fistula, otitis externa	1
	Otitis media, chronic otorrhoea, tumour in the ear and F.B. Tympanitis.	1
Eye	Anatomical considerations and examination of the eye.	1
Surgical affections of the eye	Entropion, ectopion, growths and tumours of eyelid and conjunctiva, conjunctivitis; occlusion of nasolacrimal duct, squint.	1
Eye ball	Affections of cornea, ciliary apparatus, and lens, traumatic affections of the eye. Hydrophthalmia, Glaucoma, tumours of eye, Panophthalmia, Retinal detachment. Injuries and infections of anterior and posterior chambers	1
Affections of Neck	Yolk gall, yolk abscess, yolk tumours, torticollis; affections of withers.	1
. Affections of oesophagus	Oesophageal ulcers, oesophageal stenosis, dilation and diverticulum; choking.	1
Total		33

Practical

Major topic	Minor topic	No. of lectures.
X-ray	Familiarization with and operation of the X-ray equipment, X-ray accessories and dark room equipments.	1
	Positioning and radiography of different parts of the body in small and large animals. Adoption of safety measures:	1
	film processing, handling, viewing and interpretation of an X-ray film. Familiarization with film contrast, density and detail; spot film viewing, Common defects of X-ray films. Interpretation of classified lesions	1
	Radiographic pathology of the skull - large and small animals (clinical cases/transparencies).	1
	Radiographic pathology of bones and joints -small and large animals.	1
	Radiographic pathology of thorax.	1
	Radiographic pathology of abdominal cavity.	1
	Demonstration of contrast techniques of small animals.	1

Fluoroscopy & ultrasonography	Familiarization with fluoroscopic examination and ultrasonography	1
	Techniques and application of diathermy, electrical stimulators, ultrasonic therapy.	1
Therapy	Use of hot and cold applications, massages and planned exercise. Infra-red and ultraviolet rays etc; their precautions.	1
Mouth, tongue, nasal, tooth surgery	Exploration of the mouth and use of various mouth gags	1
	Amputation of tongue, partial glossectomy for milk suckling in cattle (operation for crib-biting)	1
	Resection of nasal septum in cattle, puncturing nasal septa for nose-ring.	1
	Trephining of sinuses in various species (bovines and equine).	1
	Ligation of Stenson's duct. Tooth rasping;	1
Horn surgery	Amputation of horn (flap method and saw method), diebudding	1
Ear surgery	Otoscopy in dog and cattle.	1
	Operation for ear haematoma and ear cropping in dog.	1
	Zepp's operation in dog.	1
	Drainage of chronic otitis in cattle.	1
Respiratory tract surgery	Tracheotomy and tacheostomy, tracheoscopy.	1
	Bronchoscopy, Oesophagoscopy and oesphagotomy.	1
Eye surgery	Ophthalmoscopy and tonometry; tests for blindness;	1
	Operation for ectropion and entropion.	1
	Keratocentesis, operation for corneal ulcer (conjunctivo keratoplasty).	1
	Protection and bandaging of eye.	1
	Enucleation of the eye, extirpation of the eye	1
Tail surgery	Amputation of tail.	1
Guttural pouch & vertebrae surgery	Operation for draining the guttural pouch; Hyovertebrotomy	1

Total		30
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Reference

- Veterinary Radiology (Basic principles and radiographic positioning) by A.P. Singh and Jit Singh.
- Ruminant Surgery, by R.P.S.Tyagi and Jit Singh.
- Surgical principle and techniques by W.F. Guard.
- Essentials of Veterinary Surgery by A. Venugopalan.
- Dollar's Veterinary Surgery by J.J.O's Conner (4th edition).
- Veterinary Clinician,s Guide by Harpal singh, Amresh Kumar and P.C.Chaudari.

EIGHTH SEMESTER

Course Title: CLINICAL VETERINARY MEDICINE-I
(General and Systemic)

Course Code: VCM- 421

Cr.hrs: 2+2=4

Full Marks:100

Theory:50

Practical:50

Syllabus with breakdown**Theory**

Major topic	Minor topic	Lectures
History and scope	History and scope of medicine, concept of and diseases-introduction, diagnosis, differential diagnosis, and prognosis	1
Terminology	General systemic states- hyperthermia, hypothermia, fever,	1
	General systemic states- Septicemia, toxemia, shock and dehydration.	1
Diseases of cattle, buffaloes, equine, sheep/goat, pigs and pet animals. Of digestive system	Definition, etiology, clinical symptoms, pathogenesis, clinical pathology, diagnosis, and treatment, prevention and control of disease of digestive system with special reference to rumen dysfunction Stomatitis, glossitis, pharyngitis, parotitis,	1
	" " " oesophagitis, choking, dilatation of oesophagus	1
	" " "- indigestion, impaction, tympany.	1
	" " "- TRP, Vagus indigestion,	1
	" " "- Vomition, Colic in horses, enteritis.	1
	" " "- Intussusception, volvulus, intestinal lithiasis.	1
	Definition, etiology, clinical symptoms, pathogenesis, clinical pathology, diagnosis, and treatment, prevention and control of diseases of stomachs in ruminants.	1
	" " "	1
	Affections of peritoneum, liver and pancreas, Ascites, jaundice .	1
Diseases of cattle, buffaloes, equine, sheep/goat, pigs and pet animals. Of respiratory system	Definition, etiology, clinical symptoms, pathogenesis, clinical pathology, diagnosis, and treatment, prevention and control of diseases of respiratory system.- Rhinitis, epistaxis, laryngitis.	1
	" " "- Bronchitis , pneumonia, pulmonary emphysema.	1
	" " "- Pleurisy, hydrothorax, pneumothorax, haemothorax, chylothorax.	1
	" " "- Asthma & broken wind.	1

Diseases of cattle, buffaloes, equine, sheep/goat, pigs and pet animals. Of cardiovascular system	Definition, etiology, clinical symptoms, pathogenesis, clinical pathology, diagnosis, and treatment, prevention and control of diseases of cardiovascular systems including blood and blood forming organs- Pericarditis, myocarditis, endocarditis, hypertrophy and dilation of heart, congestive heart failure.	1
	" " "- Haemorrhage, thrombosis, oedema, toxaemia, anaemia.	1
	" " "- Leukemia, Leukopenia, dehydration, fever.	1
Diseases of cattle, buffaloes, equine, sheep/goat, pigs and pet animals. Of uro-genital system	Definition, etiology, clinical symptoms, pathogenesis, clinical pathology, diagnosis, and treatment, prevention and control of diseases of uro-genital system- Nephritis, Nephrosis, renal colic.	1
	" " "- Albuminuria, haematuria, haemoglobinuria, urinary incontinence.	1
	" " "-Uraemia, urethritis, urolithiasis cystitis, pyelonephritis, orchitis.	1
Diseases of cattle, buffaloes, equine, sheep/goat, pigs and pet animals. Of nervous system	Definition, etiology, clinical symptoms, pathogenesis, clinical pathology, diagnosis, and treatment, prevention and control of diseases of nervous system- Epilepsy, apoplexy, paraplegia, chorea, encephalitis, meningitis, encephalomyelitis.	1
Diseases of cattle, buffaloes, equine, sheep/goat, pigs and pet animals. Of skin	Definition, etiology, clinical symptoms, pathogenesis, clinical pathology, diagnosis, and treatment, prevention and control of diseases of skin- Urticaria, alopecia, psoriasis, erythema, dermatomycosis, pododerm, photosensitization, parakeratosis, hyperkeratosis.	1
Diseases of cattle, buffaloes, equine, sheep/goat, pigs and pet animals. Of lymphatic system	Definition, etiology, clinical symptoms, pathogenesis, clinical pathology, diagnosis, and treatment, prevention and control of diseases of lymphatic system- Lymphagitis, Lymphadenitis.	1
Diseases of cattle, buffaloes, equine, sheep/goat, pigs and pet animals. Of musculoskeletal system	Definition, etiology, clinical symptoms, pathogenesis, clinical pathology, diagnosis, and treatment, prevention and control of diseases of musculo skeletal system- Myopathy, myositis, osteodystrophy, osteomyelitis, arthritis.	1
Diseases of cattle, buffaloes, equine, sheep/goat, pigs and pet animals. Of sense organs	Definition, etiology, clinical symptoms, pathogenesis, clinical pathology, diagnosis, and treatment, prevention and control of diseases of sense organs.- Conjunctivitis, keratitis, otitis.	1
Total		27

Practical

Major topic	Minor topic	Lectures
Clinical examination and diagnosis-	Methods of clinical examination of individual ailing animals including history taking.	1
History taking	Patient data and disease history (both present and past viz, morbidity and mortality rates, incidence, prior treatment, prophylactic and control measures adopted earlier if any, managemental condition, history of nutrition, general management and agro climatic conditions, of the area etc.	1
Patient examination	Examination of the patients including behavior and general appearance i.e. demeanour, voice, eating, drinking, defecation, urination, posture, gait, condition of skin, and body coats.	1
Inspection of body,	Examinations of head and neck, thorax, respiratory rates, rhythms, respiratory depth, type of respiration, and	1
	Examinations of cardiac sounds, chest symmetry, abdomen, external genitalia, mammary glands, and limbs.	1
Physical examination	Temperature taking, palpation and tactile percussion.)	1
	Percussion and auscultation (instruments used -immediate percussion-mediate percussion-	1
	-Acoustic and pain seeking percussions-field of percussions-normal and abnormal sounds,	1
	Combined percussion and auscultation-instruments used-fields-sounds etc	1
Examination of the body systems	Examination of the ears, eyes, conjunctiva, eyeballs, trachea.	1
	Mouth, sub maxillary lymph node and other superficial lymph nodes, jugular furrow, esophagus,	1
	Passing of stomach tube for locating obstruction if any and medication	1
	Collection of rumen fluid.	1
	Examination for specific conditions of thorax like pneumothorax, haemothorax, and hydrothorax	1
	Percussion/Auscultation of lung and cardiac areas	1

	Examination of abdomen, ruminal motility, consistency, microbial population	1
	Motility of micro flora in the ruminal fluid, pH and cellulose digestion test of ruminal fluid	1
	Use of trochar and canula.	1
	Examination of liver and kidneys in livestock and pet animals, liver biopsy function test	1
	Collection of materials like urine, faeces, skin scrapping, blood, in the livestock and pet animals (and birds).	1
	Collection of materials like serum, milk and other body fluids for laboratory tests in the livestock and pet animals (and birds).	1
Record keeping	Clinical case records.	1
Total		22

References

- A Textbook of the Diseases of Cattle, Sheep, Goats, Pigs, and horses by D.C. Blood and O. M. Radostis.
- Textbook of Clinical Veterinary Medicine by Amalendu Chakrabarti.
- Disease of animal in tropical countries -Edmonds.
- Large animal internal medicine-Bradford.

EIGHTH SEMESTER

Course Title: VETERINARY PREVENTIVE MEDICINE I
(Bacterial, Viral, Fungal)

Course Code: VEP-422

Cr.hrs: 2+2=4

Full Marks:100

Theory:50

Practical:50

Syllabus with breakdown**Theory**

Major topic	Minor topic	Lectures
Epidemiology	Principles and concept of general epidemiology, general modes, principles of prevention and control of infectious diseases. Periodicity of diseases, occurrence and dynamics of diseases transmission.	1
Diseases of cattle, horses, pigs, sheep, goats, pet animals.	Definition : incidence, etiology, epidemiology, patho genesis, transmission, clinical findings, clinical pathology, diagnosis, treatment prevention and control of mastitis , joint ill	1
	Definition : incidence, etiology, epidemiology, patho genesis, transmission, clinical findings, clinical pathology, diagnosis, treatment prevention and control of anthrax, ulcerative lymphangitis	1
	Definition : incidence, etiology, epidemiology, patho genesis, transmission, clinical findings, clinical pathology, diagnosis, treatment prevention and control of glanders, strangles	1
	Definition : incidence, etiology, epidemiology, patho genesis, transmission, clinical findings, clinical pathology, diagnosis, treatment prevention and control of black quarter, braxy	1
	Definition : incidence, etiology, epidemiology, patho genesis, transmission, clinical findings, clinical pathology, diagnosis, treatment prevention and control of Tetanus, enterotoxaemia	1
	Definition : incidence, etiology, epidemiology, patho genesis, transmission, clinical findings, clinical pathology, diagnosis, treatment prevention and control of bacillary haemoglobinurea ,botulism	1
	Definition : incidence, etiology, epidemiology, patho genesis, transmission, clinical findings, clinical pathology, diagnosis, treatment prevention and control of Colibacillosis, pasteurellosis	1
	Definition : incidence, etiology, epidemiology, patho genesis, transmission, clinical findings, clinical pathology, diagnosis, treatment prevention and control of brucellosis, tuberculosis	1

	Definition : incidence, etiology, epidemiology, patho genesis, transmission, clinical findings, clinical pathology, diagnosis, treatment prevention and control of listeriosis ,capylo bacterosis (Vibriosis), Para tuberculosis	1
	Definition : incidence, etiology, epidemiology, patho genesis, transmission, clinical findings, clinical pathology, diagnosis, treatment prevention and control of action mycosis, actinobacillosis,	1
	Definition : incidence, etiology, epidemiology, patho genesis, transmission, clinical findings, clinical pathology, diagnosis, treatment prevention and control of erysipelas and leptospirosis, Dengalo's diseases, Mad cow disease.	1
	Definition : incidence, etiology, epidemiology, patho genesis, transmission, clinical findings, clinical pathology, diagnosis, treatment prevention and control of Foot and mouth disease, vesicular stomatitis, PPR.	1
	Definition : incidence, etiology, epidemiology, patho genesis, transmission, clinical findings, clinical pathology, diagnosis, treatment prevention and control of vesicular exanthema, rinderpest, mucosal diseases	1
	Definition : incidence, etiology, epidemiology, patho genesis, transmission, clinical findings, clinical pathology, diagnosis, treatment prevention and control of malignant head, catarrh, ephemeral fever	1
	Definition : incidence, etiology, epidemiology, patho genesis, transmission, clinical findings, clinical pathology, diagnosis, treatment prevention and control of infectious bovine rhinotracheitis, leucosis, , viral pneumonia,	1
	Definition : incidence, etiology, epidemiology, patho genesis, transmission, clinical findings, clinical pathology, diagnosis, treatment prevention and control of swine fever, hog cholera;	1
	Definition : incidence, etiology, epidemiology, patho genesis, transmission, clinical findings, clinical pathology, diagnosis, treatment prevention and control of African swine fever, African horse sickness,	1
	Definition : incidence, etiology, epidemiology, patho genesis, transmission, clinical findings, clinical pathology, diagnosis, treatment prevention and control of rabies, pseudorabies, scrapie, , looping ill,	1
	Definition : incidence, etiology, epidemiology, patho genesis, transmission, clinical findings, clinical pathology, diagnosis, treatment prevention and control of equine encephalo myelitis, infectious equine anemia equine influenza	1
	Definition : incidence, etiology, epidemiology, patho genesis, transmission, clinical findings, clinical pathology, diagnosis, treatment prevention and control of, canine distemper, infectious canine hepatitis	1
	Definition : incidence, etiology, epidemiology, patho genesis, transmission, clinical findings, clinical pathology, diagnosis, treatment prevention and control of, pos diseases, infectious gastroenteritis of viral etiology	1
	Definition : incidence, etiology, epidemiology, patho genesis, transmission, clinical findings, clinical pathology, diagnosis, treatment prevention and control of, parvo, plapillomatossi,	1

	Definition: incidence, etiology, epidemiology, patho genesis, transmission, clinical findings, clinical pathology, diagnosis, treatment prevention and control of Ringworm, favurs, histoplasmosis, sporotrichosis, coccididomycosis.	1
Poultry diseases	Definition : incidence, etiology, epidemiology, patho genesis, transmission, clinical findings, clinical pathology, diagnosis, treatment prevention and control of pullorum disease, salmonellosis	1
	Definition : incidence, etiology, epidemiology, patho genesis, transmission, clinical findings, clinical pathology, diagnosis, treatment prevention and control of fowl plague, fowl typhoid	1
	Definition : incidence, etiology, epidemiology, patho genesis, transmission, clinical findings, clinical pathology, diagnosis, treatment prevention and control of infectious lymngotracheitis, Avian encephalomyelitis	1
	Definition : incidence, etiology, epidemiology, patho genesis, transmission, clinical findings, clinical pathology, diagnosis, treatment prevention and control of avian infectious bronchitis ranikhet disease	1
	Definition : incidence, etiology, epidemiology, patho genesis, transmission, clinical findings, clinical pathology, diagnosis, treatment prevention and control of, Marek's disease ,leucosis complex,EDS-76	1
Total		29

Practical

Major topic	Minor topic	Lectures
Laboratory examination	Collection, preservation and dispatch of material for laboratory examination. –blood,	1
	Collection, preservation and dispatch of material for laboratory examination. -urine,	1
	Collection, preservation and dispatch of material for laboratory examination. –faeces	1
	Collection, preservation and dispatch of material for laboratory examination -skin scrapings/biopsy	1
	Collection, preservation and dispatch of material for laboratory examination –body fluids etc.	1
Culture examintion	Culture and sensitivity of isolates,	1
	“ “ “	1
	“ “ “	1
	“ “ “	1
	“ “ “	1
Demonstration and identifcaiton	demonstration identification of fungi and other pathogens	1
	“ “ “	1
	“ “ “	1
	“ “ “	1
Tests	Screening of livestock through tests,	1
	“ “ “	1

	“ “ “	1
Campaigns	mass diagnostic campaigns	1
	“ “ “	1
	“ “ “	1
Field work.	Vaccination and other disease prevention and control porogrammes in the field.	1
	“ “ “	1
	“ “ “	1
	“ “ “	1
	“ “ “	1
	Total	23

Reference

- A text book of the disease of cattle, sheep, pig , goat, horses- D.C. Blood and O.M.Radostis
- A text book of preventive medicine –Amlendu Chakravarti.
- The Merck Veterinary Manual
- Diseases of poultry-B.W. Calnek, H.John Barnes, C.W.Beard, W.M.Reid, H.W.Yode
- Disease of poultry and their control-Chandra.

EIGHTH SEMESTER**Course Title: PROJECT WORK ON VETERINARY FIELD CLINICS-I****Course Code: VFC-421****Cr.hrs: 0+2=2****Full mark:50****Theory-0****Practical:50****Syllabus with breakdown**

Major topic	Minor topic	Lectures
Visit to clinic and village	Visiting to clinical centers/village carry out surveillance work.	1
	“ “ “	1
	“ “ “	1
	“ “ “	1
	“ “ “	1
	“ “ “	1
	“ “ “	1
	“ “ “	1
	“ “ “	1
	“ “ “	1
	“ “ “	1
Surveillance work	Visiting to clinical centers/village carry out surveillance work. Handling & examination of sick animals. Primary diagnosis and treatment of simple cases	1
	“ “ “	1
	“ “ “	1
	“ “ “	1
	“ “ “	1
	“ “ “	1
Case study in field visit	Visiting to clinical centers/village carry out surveillance work. Handling & examination of sick animals. Primary diagnosis and treatment of simple cases . referring complicated cases for specialized diagnosis & treatment	1
	“ “ “	1
	“ “ “	1
	“ “ “	1
	“ “ “	1
Presentation	Preparation and presentation of group case study reports depending upon the number and type of cases.	1

	“	“	“	1
	“	“	“	1
	“	“	“	1
	“	“	“	1
	“	“	“	1
Total				29

Reference

- A text book of the disease of cattle, sheep, pig , goat, horses- D.C. Blood and O.M.Radostis
- A text book of preventive medicine –Amlendu Chakravarti.
- The Merck Veterinary Manual
- Diseases of poultry-B.W. Calnek, H.John Barnes, C.W.Beard, W.M.Reid, H.W.Yode
- Disease of poultry and their control-Chandra.

EIGHTH SEMESTER

**Course Title: PROJECT WORK ON VETERINARY LABORATORY
DIAGNOSIS-I**

Course Code: VLD-421

Cr.hrs: 0+2=2

Full mark: 50

Theory:0

Practical:50

Syllabus with breakdown

Major topic	Minor topic	Lecture
Case study	Handlings of cases brought at veterinary teaching hospital.	1
	“ “ “	1
	“ “ “	1
	“ “ “	1
Clinic/hospital diagnosis	Examining diagnosing and treating primary cases of sick animals at the clinics/Hospital	1
	“ “ “	1
	“ “ “	1
	“ “ “	1
	“ “ “	1
	“ “ “	1
	“ “ “	1
	“ “ “	1
	“ “ “	1
	“ “ “	1
	“ “ “	1
	“ “ “	1
	“ “ “	1
	“ “ “	1
	“ “ “	1
Sample collection	Collection of sample skin scraping, biochemical, parasitological, pathological and microbiological) analysing and correlating with clinical findings	1
	“ “ “	1
	“ “ “	1
	“ “ “	1
	“ “ “	1
Record preparation	preparation of clinical records	1
Total		26

NINTH SEMESTER**Course Title: ANDROLOGY AND ARTIFICIAL INSEMINATION****Course Code: VOG-512****Cr.hrs: 2+2=4****Full Marks:100****Theory:50****Practical:50****Syllabus with breakdown****Theory**

Major topic	Minor topic	No. of lectures
Reproductive physiology, anatomy, and behavior.	Introduction to Andrology.	1
	Development of male genitalia and gonads.	1
	Comparative study of male genitalia and gonads.	1
	Growth, puberty, sexual maturity and libido.	1
	Endocrine control of reproduction in the male domestic animals.	1
	Factors affecting maturity and sex drive in bulls.	1
	Sexual behavior in males.	1
Male infertility	Forms of male infertility.	1
	Factors affecting infertility in male.	1
	Diagnosis and treatment of infertility in male.	1
Diseases and abnormalities of male genitalia	Diseases of male genitalia, their diagnosis and treatment.	1
	Abnormalities and malformations of male genitalia, their diagnosis and treatment.	1
	Diagnosis and treatment of coital injury and infections.	1
	Testicular hypoplasia and degeneration.	1
	Diseases of the accessory sex glands.	1
Artificial Insemination	Introduction, history and development of A.I.	1
	Advantages and limitations of A.I.	1
	Methods of semen collection in various species.	1
	Technique of A.I.	1
	Factors affecting quality and quantity of semen.	1
	Tests for evaluation of semen.	1
	Tests for evaluation of semen.	1

	Preservation of semen at different temperatures.	1
	Storage and shipment of semen.	1
	Semen metabolism.	1
	Biochemistry of semen.	1
Total		26

PRACTICAL BREAKDOWN:

Major topic	Minor topic	No. of lectures
Andrological Investigation	Andrological investigations of breeding bulls.	1
	Assessment of sires. Physical examinations – observing sexual behavior, palpation of scrotum, spermatic chord, seminal vesicles and ampullae.	1
	Examination for sperm activity, and morphology of semen.	1
	Diagnosis of reproductive disorders in bulls.	1
Artificial Insemination	Preparation of A.V. and collection of semen.	1
	Evaluation of semen.	1
	Dilution of semen. Preservation techniques at different temperature.	1
	Freezing of semen.	1

	Insemination techniques in chilled and frozen semen.	1
	Planning and organization of A.I. center.	1
	Selection, care, training and maintenance of breeding bulls for A.I.	1
	Recording systems. Care, sterilization, storage and upkeep of equipment used for Artificial Insemination.	1
Embryo Transfer	Embryo transfer technique.	1
Total		13

Reference

- Physiology and Reproduction and AI in Cattle-Salisbury G.W. and N.L. Yendermare.
- Artificial Insemination of Farm Animals –Enos J. Perry.
- Reproduction in Farm Animal- ESE Hafez

NINTH SEMESTER**Course Title: REGIONAL AND CLINICAL SURGERY II
AND LAMENESS****Course Code: VSR-513****Cr.hrs:2+2=4****Full Marks:100****Theory:50****Practical:50****Syllabus with breakdown****Theory**

Major topic	Minor topic	No. of lectures
Thoracic Surgery	Surgical approaches to the thorax and general considerations for thoracic surgery.	1
	Contusion and fracture of rib, injuries of coastal cartilage, fracture of sternum, perforated wounds, sternal fistula, pneumocoele.	1
	Surgical approach to Traumatic pericarditis of cattle, heart worm disease in dogs.	1
Abdominal Surgery	Surgical approach to the abdomen in various species of animals.	1
	Hernia, its classification, etiology, diagnosis and treatment in various species. Specific hernia: umbilical, perineal (other) ventral, inguinal, and crural, pelvic and diaphragmatic hernia in large and small animals.	1
	Surgical affections of the stomach (in dog) cardia, pyloric stenosis, torsion of stomach, gastric ulcerations, tumours, foreign bodies in the stomach.	1
	Surgical treatment for the affections of stomach in ruminants, ruminal impaction, traumatic reticulitis, abomasal displacement and omasal impaction.	1
	Surgical infections of intestine, colic, intestinal obstruction, intussusception and strangulation (volvulus). (in large and small animals).	1
	Caecal dilatation, torsion, typhlitis perforation of intestine, perforating wounds and fistula of abdomen.	1
	Affections of rectum-prolapse, tumours, tear of the rectum, atresia ani, atresia ani- et - recti et - coli, affections of anal glands. Abscess (supra-rectal), rectovaginal fistula, paralysis of rectum, haemmorides , stenosis of rectum and anus.	1
	Surgical affection in liver, spleen, pancreas.	1
Surgical conditions of Urogenital system	Surgical affections of kidney, ureters and urinary bladder. Congenital malformations	1
	Urolithiasis and urethral stenosis, their sequele and surgical treatment.	1
	Surgical affections of penis and sheath, affections of testicle, scrotum; castration in large and small animals. Spaying in various species; their purpose, techniques and complications.	1

Surgical conditions of udder, teat and tail.	Surgical affections of udder and teat. Affections of tail.	1
Lameness	Lameness, its definition and classification. Body confirmation in relation to lameness (trunk and forelimb). Body confirmation in relation to lameness (Hind limb)	1
	Diagnosis of lameness. General methods of therapy in lameness.	1
Surgical conditions affecting the joints	Specific joint diseases in large animals and treatment. Specific joint disease in dogs and their treatment (intervertebral disc protrusion; spondylitis; elbow and hip dysplasia; rupture of cruciate ligament etc.)	1
Fracture	Application of external and internal immobilization for fracture, their advantages and disadvantages. Rehabilitation.	1
Surgical conditions affecting the fore limb	Shoulder slip (Sweeny). Bicipital bursitis. Omarthritis, capped elbow, radial paralysis, carpalitis, bent knee, knock-knee. Hygroma of knee, open knee, joint, blemished knee.	1
	Fracture of carpal bone, fracture of accessory carpal, contraction of digital flexors. Splints; sore shin. Tendinitis, wind puffs, sesamoiditis.	1
	Osslets, ringbones, quittor, sidebones, navicular disease, pyramidal disease; fracture of extensor process. Laminitis, sand crack, seedy toe, fracture of third phalanx, pedal osteitis. Canker, thrush and corn.	1
Surgical conditions affecting the hind limb	Monday morning diseases, cording up, myositis of Psoas muscle, iliac thrombosis. Crural paralysis, sub-luxation of sacro-iliac ligament, rupture of round ligament, trochantric bursitis. Femoral nerve paralysis.	1
	Upward luxation of patella, stringhalt. Gonitis, chondromalacia of patella, fracture of fibula, rupture of tendo-achilles, rupture of peroneus tertius, Fibrotic myopathy and ossifying myopathy. Thoroughpin, Bog spavin, Spavin, Curb.	1
Shoeing	Therapeutic shoes and corrective shoeing.	1
Surgical conditions of bovine limbs	Bovine lamenesses: contusions of sole, ulceration of sole. Septic laminitis, chronic laminitis, avulsion of hoof and declawing. Interdigital fibroma, cyst, sand crack, hoof deformities.	1
Soundness	Examination of animals for soundness and preparation of soundness certificate.	1
Total		27

Practical

Major topic	Minor topic	No. of lectures	
Regional Surgery	Familiarization with the landmarks for the approach to various visceral organs.	1	
	Thoracocentesis.	1	
	Abdominocentesis.	1	
	Laparotomy and visualization of viscera - small animals. (Gastrotomy in dogs)	1	
	Laparotomy and palpation of viscera-large animals.	1	
	Urethrotomy.	1	
	Castration.	1	
	Vasectomy and caudectomy.	1	
	Ovario-hysterectomy.	1	
	Thoracotomy (demonstration).	1	
	Cystotomy and Cystorraphy (demonstration).	1	
	Splenectomy.	1	
	Surgery of Locomotor Apparatus/ Soundness	Examination of the horse for confirmation of body (head, trunk, fore limb and hind limb) and diagnosis of lameness.	1
		Plaster of paris cast of limb in dogs.	1
Plaster of paris bandage in calves.		1	
Familiarisation with various orthopaedic instruments, hanging pin cast, transfixation pinning.		1	
Intramedullary pinning in dog (Demonstration)		1	
Application of k-nail in calves		1	
Neurectomies of forelimb.		1	
Neurectomies of hind limbs.		1	
Demonstration of corrective shoeing, Examination and preparing of bovine foot (Demonstration)		1	
Amputation of hoof in calves.		1	
Amputation of limbs.		1	
Demonstration of various surgical shoes and their uses. Examination of horse for soundness and preparation of certificate for soundness.		1	
Tenotomies, suturing of tendon, shortening of tendon. Medial patellar desmotomy.		1	
Total		25	

Reference

- Ruminant Surgery, by R.P.S.Tyagi and Jit Singh.
- Surgical principle and techniques by W.F. Guard.
- Essentials of Veterinary Surgery by A. Venugopalan.

- Dollar's Veterinary Surgery by J.J.O's Conner (4th edition).
- Veterinary Clinician's Guide by Harpal Singh, Amresh Kumar and P.C.Chaudari.
- Techniques in Large Animal Surgery by A.Simon Turner and C.Wayne Mellwraith.
- Veterinary Surgical Techniques (1st edition) by Amresh Kumar.
- Handbook of Small Animal arthropedics and fracture treatment by W.O.Brinker, D.L. Piermattei, G.L. Flo

NINTH SEMESTER**Course Title: VETERINARY ETHICS & JURISPRUDENCE****Course Code: VCM-513****Cr.hrs: 1+0=1****Full Marks:25****Theory:25****Practical:0****Syllabus with breakdown**

Major topic	Minor topic	No. of lectures
Legal duties and laws	Legal duties of Veterinarians.	1
	Forensic and State Medicine Laws. Common offences against animals and Laws related to these offences.	1
Legal aspects of examination of animals	Legal point and examination of living and dead animals in criminal cases.	1
	Mischief, Killing, Maiming and poisoning. Cruelty to the animals and Bestiality.	1
	Legal aspects of: -Examination of animals for soundness. Examination of injuries.	1
	Post-mortem examination: Causes of sudden death in animals. Collection and dispatch of materials for chemical examination.	1
Adulteration and Legal proceedings	Detection of frauds. Alteration of description, bishoping, etc. to mask a disease. Sale of unfit meat, buffalo slaughter.	1
	Evidence procedure in court. Provisions in the Nepali rules and regulations relating to animals.	1
	Slaughter Act relating to animals.	1
	Concept relating to offences affecting public health, poisons and adulteration of drugs.	1
Importation and insurance	Livestock Importation concept.	1
	Evidence Liability. Insurance.	1
Ethics for Veterinarians	Code of Conduct and Ethics for Veterinarians - the regulations made under Nepal Veterinary Council Act.	1
Total		13

Reference

- Bulletin of Animal Health and Livestock services act 2055 publ. By Directorate of Animal Health.
- Veterinary Jurisprudence and postmortem-Dabas and Saxena.
- Veterinary Ethics and Jurrispundence – Kirti Dua

NINTH SEMESTER**Course Title: PREVENTIVE VETERINARY MEDICINE-II****Course Code: VEP-513****Cr.hrs: 2+2=4****Full Marks:100****Theory:50****Practical:50****Syllabus with breakdown****Theory**

Major topic	Minor topic	No. of lectures
Trematodes	Definition, incidence, etiology, epidemiology, pathogenesis, transmission, clinical findings, diagnosis, treatment, prevention and control of Fasciolosis.	2
	Definition, incidence, etiology, epidemiology, pathogenesis, transmission, clinical findings, diagnosis, treatment, prevention and control of amphistomosis.	1
	Definition, incidence, etiology, epidemiology, pathogenesis, transmission, clinical findings, diagnosis, treatment, prevention and control of Opisthorchosis	1
	Definition, incidence, etiology, epidemiology, pathogenesis, transmission, clinical findings, diagnosis, treatment, prevention and control of Paragonimosis.	1
	Definition, incidence, etiology, epidemiology, pathogenesis, transmission, clinical findings, diagnosis, treatment, prevention and control of schistosomosis.	1
Nematodes	Definition, incidence, etiology, epidemiology, pathogenesis, transmission, clinical findings, diagnosis, treatment, prevention and control of gastrointestinal nematodiasis.	3
	Definition, incidence, etiology, epidemiology, pathogenesis, transmission, clinical findings, diagnosis, treatment, prevention and control of Hookworms.	2
	Definition, incidence, etiology, epidemiology, pathogenesis, transmission, clinical findings, diagnosis, treatment, prevention and control of verminous bronchitis.	1
	Definition, incidence, etiology, epidemiology, pathogenesis, transmission, clinical findings, diagnosis, treatment, prevention and control of Filarial worms.	2
Cestodes	Definition, incidence, etiology, epidemiology, pathogenesis, transmission, clinical findings, diagnosis, treatment, prevention and control of echinococcosis.	1
	Definition, incidence, etiology, epidemiology, pathogenesis, transmission, clinical findings, diagnosis, treatment, prevention and control of coenurosis.	1
	Definition, incidence, etiology, epidemiology, pathogenesis, transmission, clinical findings, diagnosis, treatment, prevention and control of Neurocysticercosis.	1
	Definition, incidence, etiology, epidemiology, pathogenesis, transmission, clinical findings, diagnosis, treatment, prevention and control of tapeworm infestations in poultry.	1
Blood and Protozool Parasites	Definition, incidence, etiology, epidemiology, pathogenesis, transmission, clinical findings, diagnosis, treatment, prevention and control of Theileriosis.	1
	Definition, incidence, etiology, epidemiology, pathogenesis, transmission, clinical findings, diagnosis, treatment, prevention and control of Babesiosis.	1

	Definition, incidence, etiology, epidemiology, pathogenesis, transmission, clinical findings, diagnosis, treatment, prevention and control of Trypanosomosis.	1
	Definition, incidence, etiology, epidemiology, pathogenesis, transmission, clinical findings, diagnosis, treatment, prevention and control of Toxoplasmosis.	1
	Definition, incidence, etiology, epidemiology, pathogenesis, transmission, clinical findings, diagnosis, treatment, prevention and control of Coccidiosis.	1
	Definition, incidence, etiology, epidemiology, pathogenesis, transmission, clinical findings, diagnosis, treatment, prevention and control of Trichomonosis.	1
	Definition, incidence, etiology, epidemiology, pathogenesis, transmission, clinical findings, diagnosis, treatment, prevention and control of Anaplasmosis.	1
	Definition, incidence, etiology, epidemiology, pathogenesis, transmission, clinical findings, diagnosis, treatment, prevention and control of Ehrlichiosis, Tick bite fever.	1
	Total	26

Practical

Major topic	Minor topic	No. of lectures
Collection, preservation and dispatch of morbid materials	Collection, preservation and dispatch of materials from ailing animals.	1
	Collection, preservation and dispatch of materials from ailing animals.	1
	Collection, preservation and dispatch of materials from ailing animals.	1
Preparation and examination of smears	Preparation of smear and demonstration of organisms in stained smears and their identification.	1
	Preparation of smear and demonstration of organisms in stained smears and their identification.	1
	Preparation of smear and demonstration of organisms in stained smears and their identification.	1
Disease survey and prediction	Survey of incidence, occurrence, out break etc.	1
	Survey of incidence, occurrence, out break etc.	1
	Survey of incidence, occurrence, out break etc.	1
	Correlating the ecobiology and climatology with the disease.	1
	Correlating the ecobiology and climatology with the disease.	1
	Drawing out possible disease predictions on the basis of pre-dispositions and allied precipitating factors.	1
	Drawing out possible disease predictions on the basis of pre-dispositions and allied precipitating factors.	1
Diagnostic attempts for prophylaxis and control	Biological inoculation of suspected materials into different laboratory animals.	1
	Biological inoculation of suspected materials into different laboratory animals.	1
	Serological tests.	1
	Serological tests.	1
	Serological tests.	
Vaccination	Vaccinations for prophylaxis and control of diseases.	1
	Vaccinations for prophylaxis and control of diseases.	1
Collection, preservation and dispatch of materials for parasitic identification.	Collection, preservation and dispatch of materials for identification of ecto and endoparasites, protozoa, rickettsia and chlamydias etc.	1
	Collection, preservation and dispatch of materials for identification of ecto and endoparasites, protozoa, rickettsia and chlamydias etc.	1
	Collection, preservation and dispatch of materials for identification of ecto and endoparasites, protozoa, rickettsia and chlamydias etc.	1
Total		23

Reference

- A text book of the disease of cattle, sheep, pig , goat, horses- D.C. Blood and O.M.Radostis
- A Text Book of Preventive Medicine –Amlendu Chakravarti.
- The Merck Veterinary Manual
- Diseases of poultry-B.W. Calnek, H.John Barnes, C.W.Beard, W.M.Reid, H.W.Yode
- Disease of poultry and their control-Chandra

NINTH SEMESTER**Course Title: VETERINARY CLINICAL MEDICINE II****Course Code: VCM-512****Cr.hrs: 2+2=4****Full Marks:100****Theory:50****Practical:50****Syllabus with breakdown****Theory**

Major topic	Minor topic	No. of lectures
Metabolic diseases	Definition, etiology, clinical symptoms, pathogenesis, clinical biochemistry, clinical pathology, diagnosis, treatment, prevention and control of milk fever.	1
	Definition, etiology, clinical symptoms, pathogenesis, clinical biochemistry, clinical pathology, diagnosis, treatment, prevention and control of acute parturient hypocalcaemia in goats, sows and bitches.	1
	Definition, etiology, clinical symptoms, pathogenesis, clinical biochemistry, clinical pathology, diagnosis, treatment, prevention and control of osteodystrophy fibrosa.	1
	Definition, etiology, clinical symptoms, pathogenesis, clinical biochemistry, clinical pathology, diagnosis, treatment, prevention and control of lactation tetany in mares.	1
	Definition, etiology, clinical symptoms, pathogenesis, clinical biochemistry, clinical pathology, diagnosis, treatment, prevention and control of downer cow syndrome.	1
	Definition, etiology, clinical symptoms, pathogenesis, clinical biochemistry, clinical pathology, diagnosis, treatment, prevention and control of ketosis.	1
	Definition, etiology, clinical symptoms, pathogenesis, clinical biochemistry, clinical pathology, diagnosis, treatment, prevention and control of hypomagnesaemia	1
	Definition, etiology, clinical symptoms, pathogenesis, clinical biochemistry, clinical pathology, diagnosis, treatment, prevention and control of nutritional haemoglobinurea in cattle and buffalo.	1

	Definition, etiology, clinical symptoms, pathogenesis, clinical biochemistry, clinical pathology, diagnosis, treatment, prevention and control of azoturia in equines.	1
	Definition, etiology, clinical symptoms, pathogenesis, clinical biochemistry, clinical pathology, diagnosis, treatment, prevention and control of hypothyroidism.	1
	Definition, etiology, clinical symptoms, pathogenesis, clinical biochemistry, clinical pathology, diagnosis, treatment, prevention and control of diabetes in dogs.	1
Deficiency diseases	Definition, etiology, clinical symptoms, pathogenesis, clinical biochemistry, clinical pathology, diagnosis, treatment, prevention and control of diseases caused due to deficiency of iron.	1
	Definition, etiology, clinical symptoms, pathogenesis, clinical biochemistry, clinical pathology, diagnosis, treatment, prevention and control of diseases caused due to deficiency of copper & cobalt.	1
	Definition, etiology, clinical symptoms, pathogenesis, clinical biochemistry, clinical pathology, diagnosis, treatment, prevention and control of diseases caused due to deficiency of zinc.	1
	Definition, etiology, clinical symptoms, pathogenesis, clinical biochemistry, clinical pathology, diagnosis, treatment, prevention and control of diseases caused due to deficiency of manganese.	1
	Definition, etiology, clinical symptoms, pathogenesis, clinical biochemistry, clinical pathology, diagnosis, treatment, prevention and control of diseases caused due to deficiency of calcium.	1
	Definition, etiology, clinical symptoms, pathogenesis, clinical biochemistry, clinical pathology, diagnosis, treatment, prevention and control of diseases caused due to deficiency of phosphorous.	1
	Definition, etiology, clinical symptoms, pathogenesis, clinical biochemistry, clinical pathology, diagnosis, treatment, prevention and control of diseases caused due to deficiency of magnesium.	1
	Definition, etiology, clinical symptoms, pathogenesis, clinical biochemistry, clinical pathology, diagnosis, treatment, prevention and control of diseases caused due to deficiency of vit.A .	1
	Definition, etiology, clinical symptoms, pathogenesis, clinical biochemistry, clinical pathology, diagnosis, treatment, prevention and control of diseases caused due to deficiency of vit. D.	1
	Definition, etiology, clinical symptoms, pathogenesis, clinical biochemistry, clinical pathology, diagnosis, treatment, prevention and control of diseases caused due to deficiency of Selenium and Vit.E.	1
	Definition, etiology, clinical symptoms, pathogenesis, clinical biochemistry, clinical pathology, diagnosis, treatment, prevention and control of diseases caused due to deficiency of vit.B complex.	1
	Definition, etiology, clinical symptoms, pathogenesis, clinical biochemistry, clinical pathology, diagnosis, treatment, prevention and control of diseases caused due to deficiency of vit K &C.	1
Diseases of neonates	Definition, etiology, clinical symptoms, pathogenesis, clinical biochemistry, clinical pathology, diagnosis, treatment, prevention and control of diseases of neonates.	1

	Definition, etiology, clinical symptoms, pathogenesis, clinical biochemistry, clinical pathology, diagnosis, treatment, prevention and control of diseases of neonates.	1
	Definition, etiology, clinical symptoms, pathogenesis, clinical biochemistry, clinical pathology, diagnosis, treatment, prevention and control of diseases of neonates.	1
Total		26

Practical

Major topic	Minor topic	No. of lectures
Clinical examination.	Clinical examination of sick animals suffering from metabolic deficiency and toxic diseases	1
Metabolic profile tests	Collection and examination of ruminal fluid	1
	Collection of blood and blood serum for glucose examination.	1
	Collection of blood and blood serum for examination of glucose tolerance.	1
	Collection of blood and blood serum for examination of packed cell volume.	1
	Collection of blood and blood serum for examination of haemoglobin.	1
	Collection of blood and blood serum for examination of blood urea nitrogen.	1
	Collection of blood and blood serum for examination of serum inorganic phosphate.	1
	Collection of blood and blood serum for examination of magnesium.	1
	Collection of blood and blood serum for examination of calcium.	1
	Collection of blood and blood serum for examination of potassium.	1
	Collection of blood and blood serum for examination of sodium.	1

	Collection of blood and blood serum for examination of total proteins, albumin. and globulin	1
		1
Estimation of enzymes and micro-minerals	Collection, preservation and dispatch of materials for the estimation of micro-minerals with special reference to the soil, plants and animals relationship for the causation of diseases	1
	Collection, preservation and dispatch of materials for the estimation of enzymes with special reference to the soil, plants and animals relationship for the causation of diseases.	1
Determination of ketone bodies	Test therapy and examination of blood, urine and milk for ketone bodies.	1
Blood transfusion	Collection, evaluation, cross matching and transfusion of blood in anaemic patients.	1
Collection and examination of body fluids and biopsy materials	Collection and examination of cerebrospinal fluid.	1
	Collection and examination of bone marrow.	1

	Collection and examination of lymph node biopsy.	1
Collection of materials for laboratory/veterolegal examination	Collection of material for laboratory evaluation, vetero-legal/chemical examination.	1
Record preparations	Preparation of case records, follow-up records.	1
	Preparation of case records, follow-up records	1
	Preparation of case records, follow-up records	1
Emergency treatment.	Treatment of casualties and other emergencies in farm-stock companion animals and birds.	1
Total		26

Reference

- A Textbook of the Diseases of Cattle, Sheep, Goats, Pigs, and horses by D.C. Blood and O. M. Radostis.
- Textbook of Clinical Veterinary Medicine by Amalendu Chakrabarti.
- Disease of animal in tropical countries -Edmonds.
- Large animal internal medicine-Bradford.

NINTH SEMESTER**Course Title: PROJECT WORK ON VETERINARY FIELD CLINICS-II****Course Code: VFC-512****Cr.hrs: .0+2****Full Marks: 50****Theory: 0****Practical:50****Syllabus with breakdown**

Major topic	Minor topic	No. of lectures
Surveillance	Visit to clinical center/village to carry out the surveillance work.	1
	" " " " " " " " " " " " "	1
	" " " " " " " " " " " " "	1
	" " " " " " " " " " " " "	1
Examination, diagnosis, treatment and referral	Examination of sick animals, primary diagnosis and treatment of simple cases and referring the complicated cases for specialized diagnosis and treatment.	1
	" " " " " " " " " " " " "	1
	" " " " " " " " " " " " "	1
	" " " " " " " " " " " " "	1
	" " " " " " " " " " " " "	1
	" " " " " " " " " " " " "	1
	" " " " " " " " " " " " "	1
Case study report	Preparation and presentation of group case study reports depending upon number and type of cases.	1
	" " " " " " " " " " " " "	1
	" " " " " " " " " " " " "	1
	" " " " " " " " " " " " "	1
Animal health camp	Organization of Animal health camp.	1
	" " " " " " " " " " " " "	1
	" " " " " " " " " " " " "	1
	" " " " " " " " " " " " "	1
Report preparation	Compilation, analysis and submission of the report.	1
	" " " " " " " " " " " " "	1
	" " " " " " " " " " " " "	1
	" " " " " " " " " " " " "	1
Total		26

Course Code: VPW 511

Course title: Proposal Writing

Credit Hours: 1

Full Mark: 25

Theory: 25T

Syllabus with breakdown

Theory

S. No.	Topic	Lectures
1	Introduction of Project Components	2
2	Identification of Problem and Selecting topic	1
3	Setting problems by problem tree analysis	1
4	Setting objectives, definition, scope and limitation	2
5	Identification of resources and methodology	1
6	Development of sampling methods	1
7	Development of PCN and full proposal	2
8	Analysis of data and preparing report	1
9	Questioners development	1
10	Data management and statistical analysis	1
11	Technical writing, editing and formating	1
12	Literature citation and final hard copy production	1
	Total	15

Textbook/References

- Basic guidelines for Writing Project Proposal by Singh Raj Uprety
- Field work Assignment and Report Writing by Prem R. Panta
- Technical Report Writing Today by Steven A. Pouley by Daniel G. Riordan
- MLA Handbook of Writers of Research Papers by Joseph Giballi
- Writing Remedies: Practical Exercise for Technical Writing by Edmund H. Weises

Course Code: VAW 511

Course title: Animal Welfare

Credit Hours: 1

Full Mark: 25

Theory: 25

Syllabus with breakdown

Theory

S. No.	Topic	Lectures
1	Introduction to concepts of animal welfare and ethics	1
2	Welfare assessment methods and the five freedoms	1
3	Human-animal interaction	1
4	Physiological and behavioral indicators of animal welfare	1
5	Immune and production indicators of welfare	1
6	Welfare of animals used in research, testing and education	1
7	Farm animal welfare, animals during transportation	1
8	Animal welfare in commercial livestock farming practices	1
9	Pet and companion animal welfare	1
10	Companion animals - population control programmes	1
11	Wild animal welfare	1
12	Animal welfare during natural calamities and disaster management	1
13	Euthanasia, cruelty to the animals and bestiality	1
14	Animal welfare legislations and organizations	1
15	Development of veterinary ethics and role of veterinarian on animal welfare	1

References

- World Society for Animals 2007. Concept in Animal Welfare: Animal Welfare Syllabus (CD ROM format). London: University of Bristol and WSPA
- Legood, Giles ed. 2000. Veterinary Ethics: An Introduction. New York: Continuum
- Fraser A. F. and D. M. Broom 1997. Farm Animal Behavior and Welfare. Third Edition Cambridge: CABI Publishing.
- Gergory, Gregory G. 1998. Animal Welfare and Meat Science. Cambridge, CABI Publishing
- Stafford Kevin 2006. The Welfare of Dogs-Animal Welfare Series Volume 4.Dordrecht:Springer

ALTERNATIVE VETERINARY MEDICINE**CAVM- 511****Non-Credit Hours.****Syllabus with breakdown****Theory**

Major topic	Minor topic	No. of lectures
Fundamentals	Introduction, history, philosophy, controversies and prospects.	1
Nutraceutical Medicine	Preventive Nutrition for animals: Role of specific nutrients, need, dose, balance, and rationales for use.	1
	Therapeutic Nutrition for animals: Nutrients with therapeutic applications, use and effectiveness of nutritional therapy, safety considerations.	1
	Glandular Therapy and Cell Therapy: Absorption of large molecules, tissue specificity of glandular materials, whole glandular material as a source of different biochemical activities, recent advances in cell therapy and prospects.	1
	Orthomolecular medicine: Basic principles, possible indications and applications.	1
Physical Medicine	Traditional Chinese Medicine (TCM).	1
	Acupuncture: its scientific basis and clinical applications in veterinary practices.	1
	Chiropractic Care: Rationale, examination technique, chiropractic technique, therapeutic consideration and role in animal health.	1
	Physical Therapy: Theories and applications, Therapeutic Heat, Therapeutic Cold and Compression and Stretching.	1
	Electrical application, Iontophoresis, Ultrasound, and Therapeutic Laser.	1
	Massage Therapy: Basic principles, techniques and contraindications.	1
Energetic Medicine	Bioenergetic medicine. Low Energy Photon Therapy (LEPT): Background information, LEPT induced phenomena, applications in veterinary practice, limitations, side effects and complications.	1

	Magnetic Field Therapy: Basic concepts, theory and applications, clinical indications and contraindications.	1
Botanical Medicine	Indigenous Herbal Medicine: Traditional Materia Medica.	1
	Western Herbal Medicine and Chinese Herbal Medicine: Pharmacological basis and clinical applications.	1
	Ayurvedic Veterinary Medicine: Ayurvedic concepts in health and disease, Ayurvedic principles of diagnosis and treatment,	1
	Herbs of Ayurvedic tradition and Ayurvedic Materia Medica.	1
Homeopathy	Veterinary Homeopathic Medicine: History, theoretical basis of homeopathy, philosophic aspects, scientific evidences and clinical research.	1
	Applications, selection of remedy, dosage, administration and clinical indications of veterinary homeopathy.	1
	Homeopathy in food animals practice and companion animals practice.	1
Miscellaneous Therapies	Environmental Medicine for veterinary practitioners: Definition, total load, nutrition, food allergy, inhalant allergies, chemical sensitivity, and occupational hazards of veterinary practice.	1
	Aroma Therapy: Essential oil chemistry, pharmacopoeia, potential clinical uses and contraindications.	1
	Bach Flower Therapy: Overview, history, traditional theory and material medica.	1

Holistic Veterinary Medicine	Incorporation of Complementary Veterinary Therapies into conventional small animal practices and exotic species practices.	1
	Incorporation of Holistic Medicine into food animals and equine practice.	1
Ethnoveterinary Medicine	Ethnoveterinary research, development, and extension, rationale, subject matters, principles and practices.	1
Total		26

Practical

Major topic	Minor topic	No. of lectures
Nutraceutical Medicine	Preventive and Therapeutic diet and feeding program for different food animals and companion animals.	1
	Demonstration of Glandular materials as a source of peptides and oligopeptides, enzymes, lipids and steroids.	1
Veterinary Physical Medicine	Acupuncture points in different animal species.	1
	Demonstration of techniques and instrumentation of Acupuncture and Acutherapy.	1
	Study of Chiropractic examination techniques.	1
	Demonstration of Electrical stimulation, Heat, Cold and Compression as tools of physical therapy.	1

	Demonstration of Acupressure Massage, Ice Massage, Friction Massage and Cupping.	1
	Use of Laser and Magnetic Field Therapy in veterinary practice.	1
Veterinary Botanical Medicine	Identification and clinical usage of Indigenous Herbs.	1
Ethnoveterinary Medicine	Study of Ethnoveterinary practices under Nepalese context.	1
Veterinary Homeopathy	Selection, dosage, administration and clinical indications of commonly available Homeopathic Medicines in veterinary practices.	1
Environmental Medicine	Acquaintance with occupational hazards of veterinary practice.	1
Holistic Medicine	Study of some of the commonly Integrated Practices of conventional therapies with complementary therapies in veterinary science.	1
Total		13

TENTH SEMESTER

Course Title: VETERINARY INTERNSHIP PROGRAMME

Course Code: VIP - 520

Credit Hours: 0+8

(Field Works: 0+6

Seminar Presentation: 0+2)