

CURRICULAR LAYOUT FOR THE DEGREE OF DVM

LEVEL-1, SEMESTER-1

Course No.	Course Title	Credit hrs	Contact hrs.	No. of courses
VAH 111, 112	Anatomy (Osteology, Arthrology, Myology and Angiology)	3+1	5	2
VAH 114	General Histology and Embryology	0+1	2	1
VPHY 111, 112	Basic and Circulatory Physiology	2+1	4	2
BCHEM 111, 112	Biophysics and Chemistry of Biomolecules	3+1	5	2
AS115, 116	Animal Science	3+1	5	2
LAN 111	English Language	2+0	2	1
CSM 112	Computer Application	0+1	2	1
	Total :	13+6=19	25	11

LEVEL-1, SEMESTER-2

Course No.	Course Title	Credit hrs	Contact hrs.	No. of courses
VAH 121, 122	Anatomy (Splanchnology, Neurology and Aesthesiology)	3+1	5	2
VAH 123, 124	Systemic Histology	3+1	5	2
VPHY 121, 122	Integral Physiology	1+1	3	2
VMH 121, 122	Bacteriology	3+1	5	2
BCHEM 123, 124	Metabolism of Biomolecules	3+1	5	2
PS 123,124	Elementary Poultry Science	3+1	5	2
	Total :	16+6=22	28	12

LEVEL-2, SEMESTER-1

Course No.	Course Title	Credit hrs	Contact hrs.	No. of courses
VAH 216	Comparative Anatomy and Neuroanatomy	0+1	2	1
VPHY 211	Nutritional Physiology	2+0	2	1
VMH 211, 212	Virology	3+1	5	2
VPAR 211, 212	General Parasitology, Helminthology and Malacolog	3+1	5	2
AGRON 211, 212	Forage Agronomy	2+1	4	2
STAT 215, 216	Biostatistics	2+1	4	2
DS 213, 214	Elementary Dairy Science	3+1	5	2
	Total :	15+6=21	27	12

LEVEL-2, SEMESTER-2

Course No.	Course Title	Credit hrs	Contact hrs.	No. of courses
VPHY 221	Endocrine and Reproductive Physiology	2+0	2	1
VMH 222	Mycology, Rickettsiology, Mycoplasmaology and Chlamydiology	0+1	2	1
VMH 223, 224	Immunology and Serology	2+1	4	2
VPAR 221, 222	Entomology	2+1	4	2
VPATH 221, 222	General Pathology	3+1	5	2
VPHA 221, 222	General Pharmacology and Chemotherapeutics	3+1	5	2
AN 223, 224	Animal Nutrition	3+1	5	2
	Total :	15+6=21	27	12

LEVEL-3, SEMESTER-1

Course No.	Course Title	Credit hrs	Contact hrs.	No. of courses
VAH 318	Applied Anatomy (Topographic and surgical anatomy)	0+1	2	1
VMH 311, 312	Animal and Poultry Hygiene and Management	3+1	5	2
VPAR 311, 312	Protozoology	2+1	4	2
VPHA 311	Systemic Pharmacology	3+0	3	1
VPATH 311, 312	Systemic Pathology and Oncology	3+1	5	2
VM 311, 312	Clinical Methodology	2+1	4	2
AS 311, 312	Animal Waste Management	2+1	4	2
Total :		15+6=21	27	12

LEVEL-3, SEMESTER-2

Course No.	Course Title	Credit hrs	Contact hrs.	No. of courses
VPATH 321	Pathology of Infectious and Non-Infectious Diseases	2+0	2	1
VPHA 321, 322	Toxicology	3+1	5	2
VM 321, 322	Epidemiology and Preventive Medicine	3+1	5	2
VM 323, 324	Systemic Diseases of Farm Animals	3+1	5	2
VSO 321, 322	General Surgery	3+1	5	2
ABG 329, 330	Genetics and Animal Breeding	3+1	5	2
Total :		17+5=22	27	11

LEVEL-4, SEMESTER-1

Course No.	Course Title	Credit hrs	Contact hrs.	No. of courses
VPATH 411, 412	Poultry Pathology	2+1	4	2
VM 411, 412	Small, Zoo and Laboratory Animal Medicine	3+1	5	2
VM 413	Metabolic and Nutritional Diseases of Farm Animals	2+0	2	1
VSO 411	Anesthesiology	3+0	3	1
VSO 413, 414	Obstetrics and Gynaecology	3+1	5	2
FS 413, 414	Livestock Farm Design and Environment	3+1	5	2
FPM 4101, 4102	Farm Operation and Management	3+1	5	2
Total :		19+5=24	29	12

LEVEL-4, SEMESTER-2

Course No.	Course Title	Credit hrs	Contact hrs.	No. of courses
VM 421, 422	Infectious Diseases of Farm Animals	3+1	5	2
VM 423, 424	Poultry Medicine	2+1	4	2
VSO 423, 424	Radiology and Soundness	2+1	4	2
VMH 421, 422	Food Hygiene, Microbiology and Safety	2+1	4	2
VSO 425, 426	Andrology and Artificial Insemination	2+1	4	2
AGEXT 423, 424	Agricultural Extension Education	3+1	5	2
Total :		14+6=20	26	12

LEVEL-5, SEMESTER-1

Course No.	Course Title	Credit hrs	Contact hrs.	No. of courses
VPHA 512	Clinical Pharmacology and Pharmacy	0+1	2	1
VPATH 512	Clinical Pathology and Necropsy	0+1	2	1
VM 512	Clinics (Medicine)	0+1	2	1
VSO 512	Clinics (Therigenology)	0+1	2	1
VSO 514	Clinics (Surgery)	0+1	2	1
VMH 511	Veterinary Public Health	2+0	2	1
VM 511	Forensic Medicine, Jurisprudence and Animal Welfare	2+0	2	1
VSO 517, 518	Operative Surgery	3+1	5	2
AE 511, 512	Livestock Production Economics	3+1	5	2
Total :		10+7=17	24	11
Grand Total :		187		

LEVEL-5, SEMESTER-2

Internship	12 credits
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SYLLABUS FOR DVM DEGREE

Department of Anatomy and Histology

Level I, Semester I

COURSE NO.: VAH 111

Course Title: Anatomy (Osteology, Arthrology, Myology and Angiology)

Credit hour: 3

1. Introduction: Definition, importance, classification of anatomy, topographic and descriptive terms.
2. Osteology: Skeleton, structure, composition and classification of bones of domestic animals and birds.
3. Arthrology: Definition and classification of joints, characteristics of a typical joint and its associated structures of domestic animals and birds.
4. Myology: Muscles of the different regions of the body of domestic animals and birds.
5. Angiology: Organs of circulation of domestic animals and birds.

Department of Anatomy and Histology

Level I, Semester I

COURSE NO.: VAH 112

Course Title: Anatomy (Osteology, Arthrology, Myology and Angiology)

Credit hour: 1

Morphological characters of the bones, joints, muscles and organs of circulation as per theory courses.

Books Recommended (VAH 111 & 112)

1. Sisson and Grossman's The Anatomy of the Domestic Animals, Robert Getty, (1975). Vol. 1 & 2, 5th edition, W.B. Saunders Company Philadelphia, London, Toronto.
2. Bovine Anatomy, McLeod, W.M. (1964). 2nd edition, Burger publishing Company.
3. The Anatomy of Sheep, Neil D.S. May. (1977). 3rd edition, University of Queensland Press, Sydney.
4. A guide to Regional Ruminant Anatomy Based on the Dissection of the Goat Gheorgh M. Constantinescu, Iowa State University Press/Ames.
5. Anatomy and Physiology of Farm Animals, R.D. Frandson, T.L. Spurgeon, (1992). 5th edition, Lippincott Williams and Wilkins Company, Philadelphia, London.
6. Form and function in birds, King, A.S. and McLelland, J., Academic Press, London.
7. Sturkie's Avian Physiology, Whittow, G.G. (2000). 5th edition, Academic Press, London.

Department of Anatomy and Histology

Level I, Semester II

COURSE NO.: VAH 121

Course Title: Anatomy (Splanchnology, Neurology and Aesthesiology)

Credit hour: 3

1. Splanchnology: The digestive, respiratory, urogenital and endocrine system of domestic animals and birds.
2. Aesthesiology: Special sense organs (eye, ear, olfactory and gustatory apparatus) and common integument of domestic animals and birds.
3. Neurology: Definition and classification of nervous system, neuron, structures/organs of the nervous system (brain, spinal cord, nerve, nerve trunk and nerve plexuses) of domestic animals and birds.

Department of Anatomy and Histology

Level I, Semester II

COURSE NO.: VAH 122

Course Title: Anatomy (Splanchnology, Neurology and Aesthesiology)

Credit hour: 1

Morphological characters of all the visceral organs, sense organs, endocrine organs and organs of circulation of domestic animals and birds.

Books Recommended (VAH 121 & 122) :

1. Sisson and Grossman's The Anatomy of the Domestic Animals, Robert Getty, (1975). Vol. 1 & 2, 5th edition, W.B. Saunders Company Philadelphia, London, Toronto.
2. Bovine Anatomy, McLeod, W.M. (1964). 2nd edition, Burger publishing Company.
3. Anatomy and Physiology of Farm Animals, R.D. Frandson, T.L. Spurgeon, (1992). 5th edition, Lippincott Williams and Wilkins Company, Philadelphia, London.
4. A guide to Regional Ruminant Anatomy Based on the Dissection of the Goat Gheorgh M. Constantinescu, Iowa State University Press/Ames.
5. Form and function in birds, King, A.S. and McLelland, J., Academic Press, London.

6. Sturkie's Avian Physiology, Whittow, G.G. (2000). 5th edition, Academic Press, London.

Department of Anatomy and Histology

Level II, Semester I

COURSE NO.: VAH 216

Course Title: Comparative Anatomy and Neuroanatomy

Credit hour: 1

Comparative Anatomy:

Comparative study of the bones and visceral organs (digestive, respiratory, urogenital, cardiovascular and nervous system) of horse, cattle, goat, sheep, dog, cat and birds.

Neuroanatomy:

1. Introduction to Neuroanatomy
2. Structures of the central nervous system (CNS) and its coverings.
3. Blood and CSF circulation of brain.
4. Origin, course and distribution of cranial and spinal nerves.
5. Autonomic nervous system (ANS)

Books Recommended

1. Sisson and Grossman's The Anatomy of the Domestic Animals, Robert Getty, (1975). Vol. 1 & 2, 5th edition, W.B. Saunders Company Philadelphia, London, Toronto.
2. Bovine Anatomy, McLeod, W.M. (1964). 2nd edition, Burger publishing Company.
3. The Anatomy of Sheep, Neil D.S. May, (1977). 3rd edition, University of Queensland Press, Sydney.
4. Anatomy of the Dog, Miller, M.E. (1964). 1st edition, W.B. Saunders Company Philadelphia, London.
5. A Functional approach to neuroanatomy, Earl Lawrence House and Ben Pansky, (1967). 2nd edition, McGraw-hill Book Company, New York, Toronto, Sydney, London.
6. The Anatomy of the Nervous system by Ranson and Clark, 10th edition, W.B. Saunders Company, Philadelphia.
7. Anatomy and Physiology of Farm Animals, R.D. Frandson, T.L. Spurgeon, (1992). 5th edition, Lippincott Williams and Wilkins Company, Philadelphia, London.
8. Form and function in birds, King, A.S. and McLelland, J., Academic Press, London.
9. Sturkie's Avian Physiology, Whittow, G.G. (2000). 5th edition, Academic Press, London.

Department of Anatomy and Histology

Level III, Semester I

COURSE NO.: VAH 318

Course Title: Applied Anatomy (Topographic and Surgical Anatomy)

Credit hour: 1

1. Introduction to topographic and surgical anatomy
2. Surface anatomy of the head, neck, thorax, abdomen, pelvis and limbs of domestic animals and surgical intervention.
3. Topographic location of the organs of different systems of the body of domestic animals and birds in relation to surgery.
4. Cranial and spinal nerves with reference to their surgical intervention of domestic animals and birds.

Books Recommended:

1. Sisson and Grossman's The Anatomy of the Domestic Animals, Robert Getty, (1975). Vol. 1 & 2, 5th edition, W.B. Saunders Company Philadelphia, London, Toronto.
2. Bovine Anatomy, McLeod, W.M. (1964). 2nd edition, Burger publishing Company.
3. Dollar's Veterinary Surgery, J.J. O' Connor, (1980). 4th edition, C.B.S. Publishers & Distributors, India.
4. Veterinary Operative Surgery. (1966), Dr. H.C. Elwald Berge and Dr. H.C. Melchior Westhues. 1st edition, Medical Book Company, Denmark.
5. Essentials of Veterinary Surgery by A. Venugopalan, 8th edition Oxford and IBH Publishing Co. Pvt. Ltd.
6. Veterinary Surgical Techniques by A. Kumar, 2nd Reprint 2000, Typeset at Print Craft, New Delhi-110 005.
7. Surgery to Reproductive tract by John E. Cox, 3rd edition, Liverpool University Press.

Department of Anatomy and Histology

Level I, Semester I

COURSE NO.: VAH 114

Course Title: General Histology and Embryology

Credit hour: 1

1. Microscope and its handling.
2. General staining technique and preparation of the histological slides.
3. Microscopic study of cell and cell division.

4. Microscopic study of basic tissues of animal body: Epithelial tissue, connective tissue, muscular tissues, nervous tissue and blood.
5. Gametogenesis, cleavage and gastrulation.
6. Demonstration of chick's embryo at different stages of development.

Books Recommended:

1. Color Atlas of Veterinary Histology, by William J. Bacha, Jr. Linda, M. Linda, M. Wood, Lea and Fiebiger, Philadelphia.
2. Color Atlas of Human Histology, by Mariano, S.H. Di. Fiora, 4th edition, lea and Fiebiger, Philadelphia.
3. Manual of histologic and special staining techniques. Gridley, M.F. McGraw-Hill Book Co., New York.
4. Animal tissue technique. Humason, G.L., W.H. Freeman and Co., London.
5. The Early Embryology of the chick, Bradley M. Pattern, (1971). 5th edition, McGraw-Hill Book Company New York.
6. Foundations of Embryology, Bradley M. Pattern and Bruce M Carlson, (1774), 3rd edition, McGraw-Hill book Company New York.

Department of Anatomy and Histology

Level I, Semester II

COURSE NO.: VAH 123

Course Title: Systemic Histology

Credit hour: 3

Histology of different systems of domestic animals and birds:

1. Digestive system: Segments of the alimentary tract and accessory organs.
2. Respiratory system: Nasal passages, larynx, trachea and the lungs.
3. Circulatory system: Organs of circulation (heart and blood vessels), lymphatic tissues and organs.
4. Urinary system: Kidney, ureter, urinary bladder and urethra.
5. Genital system: Male and female reproductive organs.
6. Endocrine system: Pituitary, adrenal, thyroid, parathyroid, pancreas and gonads.
7. Skin and appendages.

Department of Anatomy and Histology

Level I, Semester II

COURSE NO.: VAH 124

Course Title: Systemic Histology

Credit hour: 1

Histological study of the organs of different systems of domestic animals and birds as per theory courses.

Books Recommended (123 & 124)

1. Textbook of Veterinary Histology by B.D. Dellmann. 1998, 5th edition, Lea and Fiebiger, Philadelphia.
2. Fundamentals of the Histology of Domestic Animals by Trautmann, Alfred and Fiebiger Tosel. 1957, 13th edition Itheca, Comstock pub. Associates.
3. Bailey's Test Book of Histology by Copenharver W.M. and Bunge R.P. 1975, 16th edition, The William and Alikins company/Daltimare.
4. Basic Histology, by L. Carlos Junqueira, J. Carneiro, Robert, O. Kelly, 7th edition, Prentice-Hall International Inc.
5. Color Atlas of Veterinary Histology, by William J. Bacha, Jr. Linda, M. Linda, M. Wood, Lea and Febiger, Philadelphia.
6. Color Atlas of Human Histology, by Mariano, S.H. Di. Fiora, 4th edition, lea and Febiger, Philadelphia.
7. The histology of the fowl. Hodges, R.D., Academic Press, London.

Department of physiology

Level-I, Semester-1

COURSE NO: VPHY – 111

Course Title: Basic and Circulatory Physiology

Credit hour: 2

Introduction:

Organization of the cell, Physical structure and functional system of the cell.

Physiological phenomenon, Transport through the cell membrane- Active and Passive process . Membrane potentials, Action potentials, excitation and rhythmicity.

Blood:

Properties, Cellular and chemical constituents of blood, Hemoglobin, Hematopoiesis, Fate of blood cells, Blood volume, Abnormalities of blood cells (anemia, polycythemia, leukocytosis, blood cancer etc), Blood coagulation, Haemaglutination, Blood groups and immunogenetics, Plasma and serum, Clinical parameters of blood.

Other body fluid:

Tissue fluid, lymph, synovial fluid and cerebrospinal fluid, their formation and functions.

Cardiovascular Physiology:

Heart, Courses of circulation, Special circulations, Origin and conduction heart beat, action potential and cardiac cycle, Electrocardiogram, Heart sounds, Heart block, Regulation of heart.
Blood vessels, Blood pressure, vasomotor mechanism.

Department of physiology

Level-I, Semester-1**COURSE NO: VPHY – 112**

Course Title: Basic and Circulatory Physiology

Credit hour: 1

Preparation of chemicals and reagents for hematological studies.
Collection of blood from different animals and birds.
Study of hemolysis and estimation of hemoglobin,
Determination of erythrocyte sedimentation rate and Packed cell volume,
Total count of RBC and WBC, differential leukocyte count, Hemin test.
Effects of temperature and drugs in heart.

Books Recommended:(VPHY-111 & 112)

1. Dukes Physiology of Domestic Animals by Melvin J Swenson 9th Edn.2000, Cornel University Press, USA.
2. Text Book of Medical Physiology by Arther C Guyton and John E Hall 9th 1996, Edn. W B Saunders Company, USA.
3. Review of Physiology by L L Langley 3rd Edn. McGraw – Hill Book Company, USA.
4. Hematology and Urinalysis by S L Lamberg and R Rothstein, AVI Publishing Company, USA.

Department of physiology

Level-I, Semester-2**COURSE NO: VPHY – 121**

Course Title: Integral Physiology

Credit hour: 1

Urinary system:

Functions of kidney. Urine formation, urine volume regulation, micturition, renal clearance.

Respiratory system:

Definition, types, mechanisms of respiration, exchange and transport of respiratory gases, volumes of air respired, regulation of respiration, pulmonary compliance, Respiration in birds.

Muscular system:

Properties and functions of muscles, isotonic and isometric contraction, changes in the muscle during contraction, rigormortis.

Nervous system:

Neuron, classification, nerve, stimuli, receptors, synapse, nerve impulse, autonomic nervous system.

Temperature regulation:

Core and shell temperature, adaptation of animals in different climatic conditions, hypothermia and hyperthermia, hibernation, heat stroke and sunstroke, frostbite.

Homeostasis:

Acid and Base balance. Buffers, role of different systems in maintenance of acid bases balance. Clinical aspects of acid bas balance.

Department of physiology

Level-I, Semester-2**COURSE NO: VPHY – 122**

Course Title: Integral Physiology

Credit hour: 1

Tests for bile constituents.

General chemistry of urine. Physical examination of urine e.g. volume, colour, odour, transparency. Determination of specific gravity of urine.

Estimation of ammonia, chloride, phosphate.

Test for abnormal constituents of urine eg. glucose, albumin, acetone, calcium, bile pigment, bile salts etc. Microscopic examination of urinary sediments.

Pregnancy determination by barium chloride test.

Determination of respiratory air volumes.

Books Recommended:(VPHY-121 & 122)

1. Dukes Physiology of Domestic Animals by Melvin J Swenson 9th Edn. 2000 Cornell University Press, USA.
2. Text Book of Medical Physiology by Arther C Guyton and John E Hall 9th Edn. 1996 W B Saunders Company, USA.
3. Review of Physiology by L L Langley 3rd Edn. 1971, McGraw – Hill Book Company, USA.
4. Hematology and Urinalysis by S L Lamberg and R Rothstein, 1978, AVI Publishing Company, USA.

Department of Physiology

Level-2, Semester-1

COURSE NO: VPHY – 211

Course Title: Nutritional Physiology

Credit hour: 2

Livestock feed:

Feeds of ruminants, monogastric animals and birds, composition of feed stuffs, feed supplements, balanced diet

Digestion:

Digestion of feed stuffs, factors of digestion, prehension, mastication, composition, function and regulation of digestive juices. Digestion in simple and compound stomached animal. Movement of gastrointestinal tract, feces and defecation. Digestion in birds.

Absorption of Nutrients:

Sites, routes and mechanism of absorption. Absorption of carbohydrate, protein, fat, vitamins, minerals and water.

Utilization of Nutrients:

Metabolism of carbohydrate, protein and Fat. Nutrients homeostasis. Nutrient exchange and utilization by body tissues. Disorders of carbohydrate, protein and fat metabolism. Factors affecting metabolism.

Vitamins and Minerals:

Fat and Water Soluble Vitamins - their sources, functions and deficiency symptoms in animals and birds. Major (Calcium, Phosphorus, Magnesium, Sodium, Potassium, Sulphur) and trace (Iron, Copper, Cobalt, Manganese, Zinc) elements- their sources, functions and deficiency symptoms in animals and birds.

Books Recommended:

1. Dukes Physiology of Domestic Animals. Melvin J Swenson 9th Edn. 2000, Cornell University Press, USA.
2. Text Book of Medical Physiology. Arther C Guyton and John E Hall 9th Edn. 1996 W B Saunders Company, USA.
3. Review of Physiology. L L Langley 3rd Edn., 1971, McGraw – Hill Book Company, USA.
4. Animal Nutrition. P. Mcdonald, RA Edward and JFD Greenhalgh, Latest Edn, ELBS/ Longman., USA.

Department of physiology

Level-2, Semester-2

COURSE NO: VPHY – 221

Course Title: Endocrine & Reproductive Physiology

Credit hour: 2

Endocrinology:

Introduction, Hormone: classification, mode of action, regulation of hormone secretion. Hormones of pituitary, thyroid, adrenal, parathyroid, pineal, pancreas, testis, ovary, corpus luteum, uterus and placenta - their secretions, mode of action and function.

Reproductive Physiology:

Male: Spermatogenesis, transportation of spermatozoa, semen, capacitation. Preservation of spermatozoa for artificial insemination, Thermoregulation of testis. Male sex hormones, their mode of action and functions.

Female: Functions of ovary, folliculogenesis, ovulation and transport of ova, reproductive cycle, corpus luteum- its formation and function, fertilization, cleavage and implantation, establishment of pregnancy, gestation and prenatal physiology, parturition, role of foetus in initiation of parturition, lactation. Post partum reproduction. Nutritional aspects of reproduction. Reproductive failure in females.

Physiology of superovulation for embryo transfer.

Reproduction in birds: Spermatogenesis, oogenesis, maturation of eggs, eggshell formation and laying. Factors affecting reproduction in birds.

Books Recommended:

1. Dukes Physiology of Domestic Animals by Melvin J Swenson 9th Edn. 2000, Cornell University Press, USA.
2. Text Book of Medical Physiology by Arther C Guyton and John E Hall 9th Edn, 1996, W B Saunders Company, USA.
3. Veterinary Endocrinology and Reproduction by L. E. McDonald, 1980, Lea and Febiger, Philadelphia, USA.
4. Reproduction in Farm Animals by EE Hafez, 6th Edn, 1993, Lea and Febiger, Philadelphia, USA.

Department of Microbiology and Hygiene

Level 1, Semester 2

COURSE NO.: VMH 121

Course Title: Bacteriology

Credit hour: 3

History, development and concepts of Microbiology with special emphasis on Bacteria. Definition and general properties of Bacteria. Differentiation of prokaryote from eukaryote. Morphology, microscopic and ultramicroscopic structures including their composition and function of Bacteria. Nutrition, cultivation and growth of Bacteria.

Physiology and metabolism of Bacteria.

Bacterial genetics: Replication of DNA and RNA, plasmid, gene transfer (transformation, conjugation, transduction, F-factor, C-factor and R-factor) mutation and their effects.

Pathogenic microorganisms and their relationship to diseases; Mechanisms of infection. Microbial virulence: Factors influencing virulence, Koch's postulate.

Toxins: Exotoxin, endotoxin and their effect on host tissues; role of antitoxin against toxins. Sterilization and disinfection: Methods of sterilization, types of disinfectants and their characteristics. Classification of bacteria. Studies of the morphological, biochemical, cultural characteristics of Streptococcus, Staphylococcus, Bacillus, Clostridium, Corynebacterium, Listeria, Erysipelothrix, Actinomyces, Actinobacillus, Escherichia, Salmonella, Pasteurella, Shigella, Klebsiella, Proteus, Yersinia, Vibrio, Pseudomonas, Mycobacterium, Leptospira, Campylobacter, Brucella, Borrelia, Bordetella, Spherophorus, Spirillum, Nocardia and Moraxella with a brief reference to their pathogenicity.

Molecular Bacteriology: Genomic DNA, Plasmid DNA, PCR, Gel electrophoresis, Pulse-field gel electrophoresis, Recombinant DNA technology: Cloning and gene expression, hybridization techniques, SDS-PAGE, Western blotting, and immuno-chemiluminescent assay.

Department of Microbiology and Hygiene

Level 1, Semester 2

COURSE NO.: VMH 122

Course Title: Bacteriology

Credit hour: 1

Collection of samples for bacteriological investigations. Methods of sterilization, preparation of culture media and staining techniques. Cultural characteristics of bacteria. Isolation and identification of bacteria by animal inoculation, biochemical tests, serological tests and molecular techniques: PCR, SDS-PAGE, Western blotting. Extraction and analysis of genomic and plasmid DNA from selective bacteria. Competent cell preparation and transformation. Drug sensitivity of different types of bacteria.

Books Recommended : (VMH 121 & 122)

1. Molecular biology. 2nd. Edition. Kumar, H.D. 2000. Vikas Publishing House. Pvt. Ltd.
2. Molecular genetics of bacteria. 3rd edition. Dale, J.W. 1998. John Wiley and Sons, Inc. 605, Third Avenue, New York.
3. Animal Microbiology, Vol. 1. Buxton, A. and Frazer, G. 1977. Blackwell Scientific Publication.
4. Veterinary Bacteriology and Virology. 7th edition. Marchant, I. A. and Packer, R.A. 1967. The Iowa state University press, Ames, Iowa, USA.

5. Burrows Textbook of Microbiology. 1st edition. Freeman, BA. 1979. W.B. Saunders Company; Philadelphia. London, Toronto.
6. Topley and Wilson's principles of Bacteriology, Virology and Immunity, Vol, 1.2 and 3. Smith, G.R.Ed. 1984. Arnold Heinemann.
7. Microbiology. Davis, B.D. 1980. Harper and Row Publication.
8. Essential immunology. Roit. I.M. 1980. Blackwell Scientific Publication.

Department of Microbiology and Hygiene

Level 2, Semester 1

COURSE NO.: VMH 211

Course Title: Virology

Credit hour: 3

History of Virology, definition, general properties of Virus and differentiation of Virus from other Microorganisms.

Composition and functions of viral structures, antigenic determinants or epitopes.

Physical, chemical and biological properties of Viruses. Nomenclature and classification of Viruses.

Viral genetics: Scope, Genetic map and viral genome organization.

Inactivation and preservation of Viruses.

Purification of Viruses.

Replication of Viruses and their effects on host at cellular and multi-cellular level.

Molecular Virology: Definition and scope of Molecular Virology. Viral DNA and RNA, PCR, RT-PCR, Gel electrophoresis, Pulse-field gel electrophoresis, Recombinant DNA technology: Cloning and gene expression, Hybridization techniques, SDS-PAGE, Western blotting and Immuno-chemiluminescent assay.

Bacteriophage.

Epidemiology of Viral Infection.

Resistance to Viral infection and immunity: Interference phenomenon and interferon.

Viral vaccines and chemotherapy.

Persistent Viral infection and slow Viruses.

Studies on the properties, cultivation, pathogenicity, transmission, immunity and diagnosis of different Virus families: Paramyxoviridae, Orthomyxoviridae, Rhabdoviridae, Coronaviridae, Retroviridae, Picornaviridae, Reoviridae, Togaviridae, Flaviviridae, Bunyaviridae, Birnaviridae, Circoviridae, Poxviridae, Parvoviridae, Papovaviridae, Adenoviridae, Herpesviridae and Iridoviridae of animals, birds and human.

Department of Microbiology and Hygiene

Level 2, Semester 2

COURSE NO.: VMH 212

Course Title: Virology

Credit hour: 1

Selection, collection, transportation, preservation and preparation of virological specimens for laboratory examination. Filters and filtration techniques. Cell culture media and other necessary biologics, chemicals and reagents preparation. Cultivation and titration of viruses in intact host system, embryonated eggs, cell culture system. Purification of virus. Virus infectivity assay: Plaque assay, Focus assay. Identification of viral diseases through different serological tests. Extraction of virus RNA. Identification of Viruses by PCR and RT-PCR, Virus gene expression, analysis of viral proteins using SDS-PAGE: coomassie brilliant blue and silver stain, Western blotting and Immuno-chemiluminescent assay.

Books Recommended : (VMH 211 & 212)

1. Molecular cloning. Laboratory Manual. T. Maniatis and E.F. Fritsch, 2000. Clod spring Harbor Laboratory, USA.
2. Animal Microbiology, Vol. 1. Buxton, A. and Frazsr, G. 1977. Blackwell Scientific Publication.
3. Principles of Animal Virology. Joklik, W.K., 1988. Appletoncentury-crofts, New York.
4. Viral and rickettsial infection of Animal. Bets A.O. and York, C.J., 1967. New York Academic press.
5. Topley and Wilson's Principles of Bacteriology, Virology and Immunity, vol. 4. Smith, G.R. (Rdt.). 1984. Arnold-Heinemann.
6. Veterinary Viruses. Russel, P.H. and Edington, N., 1985. Edington Russel Publisher.
7. Genes VII. 1st edition. Benjamin, L., 2000. Oxford University Press.

Department of Microbiology and Hygiene

Level 2, Semester 2

COURSE NO.: VMH 222,

Course Title: Mycology, Rickettsiology, Mycoplasma and Chlamydia

Credit hour: 1

Fungi: Classification, properties, sample collection, preservation, transportation and cultivation of the important fungi of animals, poultry and man. Diagnosis of fungi by culture, staining, biochemical tests and molecular techniques.

Mycoplasma: Classification, properties, sample collection, preservation, transportation cultivation of the important animal and poultry mycoplasma. Diagnosis of mycoplasma by culture, staining, biochemical and serological tests and molecular techniques.

Rickettsia: Classification, properties, sample collection, preservation, transportation cultivation of the important animal and human rickettsia: Diagnosis of rickettsia by culture, staining, biochemical and serological tests and molecular techniques

Chlamydia: Classification, properties, sample collection, preservation, transportation cultivation of the important animal, poultry and human chlamydia. Diagnosis of chlamydia by culture, staining, biochemical and serological tests and molecular techniques.

Books Recommended

1. Medical mycology. Beueke, E. S. 1996. Burgess Publishing Co. 426, South Sixth Street, Minnesota.
2. Animal Microbiology, Vol. II. Buxton, A. and Frazsr, G. 1977. Blackwell Scientific Publication.
3. Viral and rickettsial infection of animals. Betts, A. O. and York, C. J. 1967. New York Academic Press.
4. Atlas of Medical mycology. 2nd edition. Moss, E.S. and Mconown, A.L. 1969. Williams and Wilkings Co. Baltimore.
5. The biology of fungi. Ingold, C.T. 1973. The English language book society and Hutchinson of London.

Department of Microbiology and Hygiene

Level 2, Semester 2

COURSE NO.: VMH 223

Course Title: Immunology and Serology

Credit hour: 2

History and modern concepts of Immunology and Serology.

Organs and cells associated with immunity.

Definition and types of immunity and resistance. General features and mechanism of immune response. Antigen: Definition, composition, properties, types and functions. Processing of antigen and their relationship with Major Histo-compatibility Complex (MHC) molecules. Response of B and T cell to antigen. Antigen binding sites and their genetics.

Antibody: Definition, properties, types and function. Theory of antibody (Ab) production. Antigen-antibody reaction and their consequences.

Chemical Mediators of the Immune system. Complement system and their role in immunity.

Induction of immune response and immune effector mechanisms. Hypersensitivity and immune tolerance: Different types of hypersensitivity, factors responsible for immune tolerance. Principles of different serological tests: Agglutination test, precipitation test, hemagglutination activity, Hemagglutination-inhibition, Passive hemagglutination tests, Complement fixation test, Fluorescent antibody technique (FAT), Radioimmunoassay, Immunohistochemistry, Enzyme linked immunosorbent assay (ELISA), Immunodiffusion test, Serum neutralization test (SNT), Focus inhibition test (FIT), counter immuno-electrophoresis and Protection test (PT).

Department of Microbiology and Hygiene

Level 2, Semester 2

COURSE NO.: VMH 224

Course Title: Immunology and Serology

Credit hour: 1

Preparation and purification of antigens. Reagents employed in serological tests, detection and measurement of antibody. RBC suspension preparation. Collection of sera from immunized and non-immunized animals, poultry and laboratory animals. Hyperimmune sera preparation. Procedures and uses of different serological tests: Agglutination test, precipitation test, hemagglutination activity, Hemagglutination –inhibition, Passive hemagglutination tests, Complement fixation test, Fluorescent antibody technique (FAT), Enzyme linked immunosorbent assay (ELISA), Immunohistochemical techniques, Immunodiffusion test, Serum neutralization test (SNT), Focus inhibition test (FIT) and Protection test (PT).

Books Recommended :(VMH 223 & 224)

1. An introduction to Veterinary Immunology, 5th Edition. Tizard, I. 1982. W.B. Saunders Co., Philadelphia, London, Toronto.
2. Essential Immunology. Roit, I.M. 1980. Blackwell Scientific Publication, Oxford.
3. Practical immunology. 3rd edition. Hudson, L. and Hay, F.C. 1989. Blackwell Scientific Publication, Oxford.
4. Immunology II. Bellanti, J.A. 1978. W.B. Saunders Company, Philadelphia, London.
5. Immunology. 2nd edition. Hood, L.E., Weissman, I.L., Wood, W.B. and Wilson, J.H. 1984. The Benjamin Cummings Publishing Company, Inc.
6. Fundamentals of immunology. 2nd edition. Bier, O.G., Silva, D.D., Gotze, D. and Mota, I. 1986. Springer Verlag, Berlin Heidelberg, New York.

Department of Microbiology and Hygiene

Level 5, Semester 1

COURSE NO.: VMH 511

Course Title: Veterinary Public Health

Credit hour. 2

Definition, scopes, objectives of Veterinary Public Health. The common basis for veterinary and Public Health practices. Human-animal interaction & animal production systems & veterinary public health.

Public Health Team: Organization, administration and function. The role of veterinarians and other related professional in the protection of human health through the safe production of foods of animal origin.

Zoonoses: Concepts and classification. Factors affecting the spread of zoonotic diseases. Impact of zoonosis on health. Role of reservoir host and vectors in transmitting zoonotic diseases. Emergent zoonotic diseases. Prevention, control and eradication of zoonotic diseases and their control program.

Concepts, scope, objective and type of Epidemiology. Ecology and ecological imbalance. Disease surveillance and risk analysis. Disseminating information on veterinary public health; quality and safety assurance in food production (meat, milk and eggs).

Causes of multifactorial diseases: Agents, host and environmental factors.

General methods of epidemiological investigation of zoonotic diseases.

Environmental Hygiene: Water and air pollution and their remediation. Water related infections. Indicator bacteria and their characteristics. Effect of acid rain and green house on health of man and animal.

The consumer: food technology & veterinary public health

Books Recommended

1. Veterinary Medicine and Human Health. Schwabe, C.W., 1965. Baltimore, William and Wilkins Company.
2. The zoonoses. 1st edition. Johan C. Bell, Stephen, R., Palmer and Jack, M. Payne (1988). Edward Arnold.
3. Diseases of animals transmissible to man. Thapaliyal, D.C. 1999. International Book Distributing Company. Iowa State University Press/Ames.
4. Veterinary Epidemiology. 2nd edition. Martin, S.W., Meek, A.H. and Willeberg, P. 1987. Principles and methods.
5. Veterinary Epidemiology. 2nd edition. Thrushfeld, M. 1986. Blackwell Science.
6. Fundamentals of Animals Hygiene and Epidemiology. Thapaliyal, D.C. 1999.

Department of Microbiology and Hygiene

Level 4, Semester 2

COURSE NO.: VMH 421

Course Title: Food Hygiene, Microbiology and Safety

Credit hour: 2

History of microorganisms in food. Role and significance of microorganisms in nature and foods.

Microorganisms important in foods of animal and avian origin. General principles of food preservation and spoilage.

Meat hygiene practices: Antemortem and post-mortem examination; transportation of meat animals; slaughtering of animals and birds. Slaughter-house management, use, treatment and disposal of abattoir by-products. Preharvest and postharvest technology of foods at farm and manufacturing level.

Abattoir: Principles for planning of an abattoir and situation in Bangladesh. Inspection of carcasses, judgment of carcasses and examination reports. Adulteration and misrepresentation of meat foods. Diseases transmitted through meat and meat products.

Milk Hygiene: Contamination and spoilage of milk and milk products, adulteration of milk. Diseases transmitted through milk and their significance on health. Bacteriological quality of milk and milk products.

Fish-borne diseases: Contamination and spoilage of fish products; factors affecting kinds and rate of spoilage. Preservation of fish and fish products.

Eggs: Contamination and spoilage of eggs; preservation of eggs.

Food poisonings: Food borne infections and intoxication. Investigation of food-borne disease outbreaks. Microbiology in food plant sanitation. Food legislation, standards and codes of practices.

Department of Microbiology and Hygiene

Level 4, Semester 2

COURSE NO.: VMH 422

Course Title: Food Hygiene, Microbiology and Safety

Credit hour: 1

Applied techniques in sampling of foods of animal origin and other related materials for Microbiological studies:

- i) Sampling of solid, liquid and surface samples.
- ii) Preparation of dilutions, determinations of MPN index and general viable counts.
- iii) Detection and enumeration of indicator bacteria.
- iv) Detection and enumeration of pathogenic and toxigenic organisms.
- v) Determination of F-value, D-values and Z-values.

Microbiological examination of specific foods:

- (i) Meat and Meat product. (ii) Liquid milk, dry milk and other milk products.
- (iii) Fish and fish products. (iv) Canned foods. (v) Frozen foods. (vi) Egg and egg products.

Determination of milk fats

Sample collection and laboratory examination for assessment of hygienic quality of meat.

PH determination of meat, chemical and organoleptic equality assessment.

Determination of quality of foods in terms of safety and quality assurance (report writing)

Differentiation between perfect and imperfect bleeding. Inspection and judgement of carcasses and meat of various food animals.

Field trips to slaughterhouse milk and fish processing plants.

Books Recommended:(VMH 421 & 422)

1. Food Microbiology. 4th edition. Frazier, W.C. and Westhoff, D.C. 1995. Tata McGraw-Hill Publishing Company Limited new Dellei.
2. Textbook of meat hygiene. 6th edition. Thonton, H. and Gracy, J.F. 1974. Bailliere Tindall, London.
3. Meat science. 3rd edition. Lawrie, R.A. 1979. Oxford, Pergamon Press.
4. Fish as food. Vol. 1. Borgstrom, G. 1961. New York and London.
5. Meat Hygiene. 9th edition. Gracey, J.F. and Collins 1992. Baillere Tindall, UK.
6. Meat hygiene. 2nd edition. Miller, A. R. 1958. Lea and Febiger, Philadelphia.

7. Meat science, milk science and technology. 3rd edition. Cross, H.R. and Overby, A. J. 1988. Elsevier Science, Oxford.
8. Food borne infections and intoxications. 2nd edition. Fred, W. Tanner 1952. The Garrard Press.
9. Food safety and quality assurance. 2nd edition. Hubbert, W.T.; Hagstad, H.V.; Spangler, E.; Hinton, M.H. and Hughes, K.L. 1996. Iowa State, University Press/Ames.
10. Fundamentals of Meat Hygiene, 1st edn., 2001, Kabco, Dhaka.
11. Hygiene, Microbiology and Safety of foods of Animal origin, 1st edn, M.M. Rahman. 2003. Published from Department of Microbiology and Hygiene.
12. Basic Food Hygiene, 1st edn, M.M. Rahman. 2003. Published from Department of Microbiology and Hygiene.

Department of Microbiology and Hygiene

Level 3, Semester 1

COURSE NO.: VMH 311

Course Title: Animal and Poultry Hygiene and Management

Credit hour:3

Objectives and scopes of livestock and poultry hygiene and management. Definition of common terms used for livestock and poultry. General characteristics of common breeds of livestock and poultry. Common abnormal behaviors of Livestock and Poultry. Principles of handling of livestock and poultry. Dentition and ageing of livestock. Rearing and Management of Livestock and Poultry.

Influences of environmental factors: Soil, Air, Ventilation, Water and housing on animal and poultry health.

Sanitation: Definition and objectives, drainage, sewerage system and disposal of wastes. Cleaning and disinfections of poultry houses and equipments; disinfectants and their application; fumigation and its importance. Hygienic and economic importance of housing and selection of sites for animal and poultry farm, concepts of modern housing, internal arrangement and space requirement for housing of livestock and poultry including laboratory animals. Safety of animal and poultry feed ingredients. Hygienic preparation of livestock and poultry houses before receiving the newly introduced livestock and poultry. Hygienic environments for rearing of livestock and poultry.

Hygienic requirements of pre-brooding and brooding conditions for the management of chicks.

Hygienic environments for rearing of livestock and poultry. Hygienic Management of hatchery, breeder, layer and broiler farms. Hygienic management concerned with breeding, feeding and transport of livestock and poultry. Bio-security and bio-safety of livestock, poultry and laboratory animals. Vaccine and vaccination schedule. Hygienic measures for the prevention and control of infectious and contagious diseases of livestock and poultry.

Department of Microbiology and Hygiene

Level 3, Semester 1

COURSE NO.: VMH 312

Course Title: Animal and Poultry Hygiene and Management

Credit hour: 1

Demonstration of external points of livestock and poultry. Identification of livestock and poultry: Breed, species etc.

Manipulation and restraining of livestock and poultry.

Demonstration of grooming, bedding, dipping, clipping, shearing, shoeing, bandages and casting of livestock. Dusting and spraying of birds. Determination of livestock and poultry health by external appearances. Practical demonstration of ageing of livestock. Livestock and poultry carcass inspection, post-mortem techniques and examination. Methods of sterilization of different instruments used in livestock and poultry farms. Sanitation of animal and poultry farms and hatcheries. Common practices for bio-security and bio-safety measures. Demonstration of carcass disposal methods. Drug administration, vaccination schedule and method for livestock and poultry.

Books Recommended : (VMH 311 & 312)

1. Animal Microbiology, by Buxton, by A. and Fraser, G. (1977). First Edition. Blackwell Scientific Publication, London, U.K.
2. The UFAW handbook on care and management of farm animals-edited by UFAW (1971). UFAW Churchill livingstone, Edinburgh, U.K.
3. Livestock Husbandry Techniques, by McNitt, J.I. (1993). Granada Publishing Ltd. London.
4. A text Book of Animal Husbandry, by banerjee, G.C. (1999). Eight Edition, Oxford and IBH publishing Co. new Delhi 11001. India.
5. an Introduction to Animal Husbandry in the Tropics, by Williamsong, G. and Payne, W.J.A. (1978). Third Edition, Longman Group Ltd., England.

6. Fundamentals of Animal Hygiene and Epidemiology, by Thapliyal, D.C. (1996). First Edition, international Book Distributing Co.
7. Haq, A. and T. Ahmad. 2001. Poultry hygiene and Disease Prevention Pak Book Empire, Lahore, Pakistan.
8. James, W. E. 1999. Handbook on Poultry Disease. American Soybean Association, New Delhi, India.
9. Herenda, D. C. and Franco, D.A. 1996. Poultry disease and Meat Hygiene, A Color Atlas. Iowa State University Press, Ames, Iowa, USA.
10. Jordan, F.T.W. (Editor) 1996. Poultry Diseases. English Language Book Society, London.
11. Rahman, M. M. *et al.*, 2004. Practical Animal and Poultry Hygiene and Management. 1st Edition Published by Department of Microbiology and Hygiene, BAU, Mymensingh, Bangladesh.

Department of Parasitology

Level 2, Semester I

COURSE NO. VPAR 211

Course title: General Parasitology, Helminthology and Malacology

Credit hour: 3

A brief introduction to Parasitology, types of animal association and parasitism, and types of parasites and hosts.

History of Parasitology, origin and evolution of parasites.

Host - parasite relationship and adaptation of parasites.

Host specificity, organ specificity and host range.

Zoological nomenclature and classification of parasitic helminth.

General morphology of helminths.

Geographical distribution and transmission of parasites.

Definition and general pattern of life cycle of helminth.

Principles of parasitic immunity and expression of immunity against parasites.

A brief study on the morphology, geographical distribution, life cycle, economic importance and control principles of the following helminths of livestock and poultry.

Trematoda:- Fasciolidae, Paramphistomatidae, Schistosomatidae, Dicrocoeliidae, Echinostomatidae, Prosthogonimidae, Troglotrematidae, Notocotylidae and Opisthorchiidae.

Cestoda:- Taeniidae, Dilepididae, Davaineidae, Anoplocephalidae, Hymenolepidae, Diphyllbothriidae.

Nematoda:- Ascarididae, Heterakidae, Oxyuridae, Strongylidae, Stephanuridae, Syngamidae, Ancylostomatidae, Trichostrongylidae, Dictyocaulidae, Metastrongylidae, Protostrongylidae, Filaroididae, Strongyloididae, Filariidae, Dracunculidae, Spiruridae, Acquaridae, Tretrameridae, Thelaziidae, Gnathostomatidae, Trichuridae, Trichnellidae, Dioctophymatidae.

A brief introduction to Malacology,

Classification, Morphology, Biology and Ecology of common fresh water snails.

Role of mollusks in the transmission of common helminth parasites of livestock and poultry.

Principles of snail control.

General control principles of parasites.

Department of Parasitology

Level 2, Semester I

COURSE NO. VPAR 212

Course title: General Parasitology, Helminthology and Malacology

Credit hour : 1

Preparation of reagents and their uses

Identification of Helminth's eggs

Faecal sample examination: Qualitative Methods

Faecal sample examination: Quantitative Methods

Identification of cercariae

Identification of metacestodes

Identification of nematode larvae

Coproculture
 Collection of helminths from visceral organs of ruminants and their preservation
 Collection of helminths from visceral organs of poultry and their preservation
 Detection of nematode larvae from field sample (grass, herbage, etc) by using Baermann's Apparatus
 Rodent perfusion for the collection of blood fluke
 Preparation of permanent slide
 Preparation of temporary slide and supravital staining
 Identification of Trematodes
 Identification of Nematodes
 Identification of Cestodes
 Microscopic measurement of helminths and their eggs
 Collection and shipment of snails
 Morphological study of snails and their identification
 Examination of snails for the recovery of cercariae
 Immunodiagnosis of parasitic infection

Books Recommended: (VPAR 211 & 212)

1. General Parasitology, Cheng T.C. 1986., Second Edition (first published in India, 1999 by Replica Press Pvt. Ltd. Delhi 110-040, India), Academic Press Inc. USA
2. Helminths Arthropods and Protozoa of Domesticated Animals. Soulsby, E.J.L. 1982. Bailliere and Tindall, London, UK.
3. Veterinary Parasitology. Urquhart G.M., Armour J., Duncan J.L. Dunn A.M. and Jennings F.W., 1987 Longman Group UK Ltd., London, UK
4. Veterinary Helminthology, Dunn A.M., 1978. William Heinemann Medical Books LTD. London, UK
5. Malacology, Malek E.A. (1974). Burgess publishing Co. Minneapolis.
6. Parasitology in Focus-Facts and Trends: Mehlhorn H. (1998). Springer-Verlag, Berlin, Germany.
7. Introduction to Helminth Parasites of Animals and Birds in Bangladesh Rahman M.H., Ahmed S. and Mondal M.M.H. (1996). Sheba Printing Press, Dhaka, Bangladesh.

Department of Parasitology

Level 2, Semester II

COURSE NO. VPAR 221

Course title: Entomology

Credit hour: 2

Introduction to Veterinary and Medical Entomology.

Classification and structure of common insects and arachnids, Vectors and vector status.

Morphology, biology, disease relationship, economic importance and control of insects and arachnids of the following groups:

Diptera: Culicidae, Ceratopogonidae, Psychodidae, Simuliidae, Tabanidae, Glossinidae, Muscidae, Fanniidae, Calliphoridae, Sarcophagidae, Oestridae, Hippoboscidae.

Siphonaptera, Hemiptera, Phthiraptera, Dictyoptera, Coleoptera, Lepidoptera, Hymenoptera.

Acari:

Mites: Astigmata, Oribatida/Cryptostigmata, Prostigmata, Mesostigmata.

Ticks: Ixodida – Argasidae and Ixodidae

Pentastomida

Control principles of arthropod pests and vectors.

Pesticides and pesticide formulations and pesticide resistance.

Department of Parasitology

Level 2, Semester II

COURSE NO. VPAR 222

Course title: Entomology

Credit hour: 1

Collection, Shipment and preservation of arthropod samples

Preparation of permanent slides, storage and handling of arthropod samples.

Diagnostic techniques and identification of important insects (Fly, Mosquitoes, lice, flea etc), arachnids (Ticks, Mites) and Pentastomida (Tongue worm).

Books Recommended: (VPAR-221 & 222)

Medical and Veterinary Entomology. Kettle. D.S. 1995. CAB international, UK.

Helminths, Arthropods and Protozoa of domesticated Animals. Soulsby E.J.L. 1982. Bailliere and Tindall, London, UK.

Veterinary Parasitology, Urquhar G.M., Armour J., Duncan J.L., Dunn A.M. and Jennings F.W. 1987. Longman Group UK Ltd., London.

Arthropods in Livestock and poultry Production, Lancaster J.L. and Meisch M.V., 1986. Ellis Horwood Ltd.

Livestock Entomology, Williams R.E., Hall R.D., Broce A.D., Scholl P.J. 1985 John Wiley & Sons.

Medical Insects and Arachnids. Lane R.P. and Crosskey R.W. 1993. Chapman & Hall., London.

Department of Parasitology

Level-3, Semester-I

COURSE NO. VPAR 311

Course title: Protozoology

Credit hour: 2

Introduction to Protozoa and Protozoology.

Taxonomy, morphology, life cycle, epidemiology, immunology and economic importance of the protozoa belonging to the following families: Trypanosomatidae, Hexamitidae, Monocercomonadidae, Trichomonadidae, Vahlkampfiidae, Endamoebidae, Haemogregarinidae, Eimeriidae, Cryptosporidiidae, Sarcocystidae, Plasmodidae, Babesiidae, Theileriidae, Balantidiidae.

Brief account of the pathogenesis, clinical signs and lesions caused by the important protozoa.

Diagnosis and control of the important protozoa.

Important Rickettsiales of Animals and Poultry in Bangladesh.

Department of Parasitology

Level-3, Semester-I

COURSE NO. VPAR 312

Course title: Protozoology

Credit hour : 1

Preparation and examination of faeces, blood lymph, excretions and secretions for protozoan parasites/parasitic stages.

Quantification of Protozoa in different materials.

Study of the morphological characters of the protozoa of livestock and Poultry in Bangladesh.

Demonstration of the lesions produced by protozoa of livestock and Poultry in Bangladesh.

Immunodiagnostic techniques in Protozoology.

Books Recommended: (VPAR 311 & 312)

General Parasitology., Cheng T.C. 1986 Second. Edition (first published in India, 1999 by Replica Press Pvt. Ltd. Delhi 110-040, India), Academic Inc. USA.

Helminths, Arthropods and protozoa of Domesticated Animals. Soulsby E.J.L., 1982. 7th Edition, Bailliere and Tindall, London, UK.

Veterinary Protozoology, Levine N.D. 1985. First Edition, Iowa State University Press, Ames, USA.

Veterinary Parasitology, Urquhart G.M., Armour J., Duncan J.L., Dunn A.M. and Jennings F.W. 1988. First ELBS Edition. Longman Scientific & Technical, UK.

Manual of Veterinary Parasitological Techniques, Ministry of Agriculture, Fisheries and Food, UK. 1979. Technical Bulletin No. 18. laboratory Techniques. Her Majesty's Stationary office, London, UK.

Department of Pathology

Level II, Semester II

COURSE NO. : VPATH 221

Course Title: General Pathology

Credit hour : 3

Introduction: Definition, branches and scope of Pathology

Cell injury, cell death and necrosis: Causes of cell injury and death, biochemical and ultrastructural changes in accidental cell death and apoptosis, characteristics of necrotic cells and tissues; differentiation of necrosis and postmortem autolysis; types of necrosis; disposition of necrotic tissues; gangrene; infarct.

Intracellular and extracellular depositions; degenerations: Fatty change, extracellular accumulation of lipids; glycogen deposition and glycogen storage diseases; lysosomal storage diseases; extracellular deposition of proteins – amyloid, albumin and fibrin.

Mineral deposits and pigments: Pathologic calcifications and ossification; gout; exogenous pigments; endogenous pigments-melanosis, hemosiderosis, jaundice, photosensitisation dermatitis.

Disturbances of growth: Aplasia, hypoplasia, atrophy, hypertrophy, hyperplasia, metaplasia, anaplasia, dysplasia, neoplasia.

Disturbances of circulation: Thrombosis and embolism; failure to clot and hemorrhage; hyperaemia and congestion; edema; shock.

Inflammation: Definition and cardinal signs; vascular and cellular events in inflammation; chemical mediators of inflammation; cells of inflammation; types of inflammation; healing.

Immunopathology: Immune response and immune effector mechanisms; hypersensitivity; autoimmunity; immunodeficiency.

Department of Pathology

Level II, Semester II

COURSE NO. : VPATH 222

Course Title: General Pathology

Credit hour : 1

Methods of collection, preservation, fixation, processing and staining of pathological specimens.

Study of basic alterations of cells and tissues using laboratory specimens, histopathological slides, illustrations and transparencies.

Books recommended (VPATH 221 & 222)

1. *Veterinary Pathology*. By Jones, T.C., Hunt, R.D. and King, N.W. 6th edition, Williams and Wilkins, Philadelphia, USA. 1997.
2. *Cells, Tissues and Disease: Principles of General Pathology*. By Majno, G. and Joris, I. Blackwell Scientific Publications, London. 1996.
3. *Veterinary Immunology*. By Tizard, I.R. 5th edition, W.B. Saunders Co., London. 1996
4. *Basic Pathology*. By Kumar, V., Cotron, R.S. and Robins, S.L. 5th edition. W.B. Saunders Co., London. 1992.
5. *Manual of Histologic Staining Methods of the Armed Forces Institute of Pathology*. By Luna L.G. [Ed]. 3rd edition, McGraw Hill Book Company, New York. 1968.
6. *Colour Atlas of Histopathology*. By Curran, R. C. 2nd Edition (reprinted). Harvey Miller Publishers, London, England. 1981.

Department of Pathology

Level III Semester I

COURSE NO. : VPATH 311

Course Title: Systemic Pathology and Oncology

Credit hour : 3

Digestive system: Pathological conditions of buccal cavity, salivary glands, oesophagus; tympanites, ruminal acidosis, traumatic reticulitis / peritonitis, gastritis, gastric ulcers, enteritis, intestinal obstruction, impaction of caecum, colitis, proctitis, peritonitis, hepatitis, cirrhosis, cholecystitis, cholelithiasis, pancreatitis, and neoplasms.

Respiratory system: Pathological conditions of the upper respiratory tract; pneumonia, pneumonites, special types of pneumonia, bronchial asthma, pleuritis, atelectasis, emphysema and neoplasms.

Cardiovascular system: Developmental anomalies; cardiac failure, myocarditis, cardiomyopathy, pericarditis, endocarditis, arteriosclerosis, arteritis, phlebitis, and neoplasms.

Hemic and lymphatic system: Pathological conditions of bone marrow, lymph nodes, spleen and thymus; anemia; and neoplasms.

Musculoskeletal system: Introduction, muscular dystrophy, muscular hypoplasia and hyperplasia, muscle glycogenosis, ossification of muscle, steatosis, atrophy, hypertrophy, degeneration and necrosis, nutritional myopathy (white muscle disease), steatitis, myositides, equine rhabdomyolysis, fracture of bone, arthritis and neoplasms.

Skin and appendices: Introduction, disorders of epidermis, dermis and subcutis, dermatitis, autoimmune skin diseases, and neoplasms.

Urinary system: Congenital anomalies, glomerulonephritis, interstitial nephritis, pyelonephritis, nephrosclerosis, cystitis, urolithiasis, and neoplasms.

Genital system: Congenital anomalies of female and male reproductive organs; cystic ovary, oophoritis, salpingitis, metritis, abortifacient infections, vaginitis, vulvitis, mastitis; orchitis, schirrous cord, gut tie, prostatitis, and neoplasms.

Endocrine system: Pathological conditions of different endocrine glands; Cushing syndrome, goiter, hypoparathyroidism, hyperparathyroidism, diabetes mellitus, diabetes insipidus, and neoplasms.

Nervous system: Pathological conditions of brain, spinal cords and peripheral nerves; encephalitis, myelitis, epilepsy, spongiform encephalopathy, and neoplasms.

Organs of special senses: Pathological conditions of eye and ear; conjunctivitis, blepharitis, keratitis, cataract, glaucoma, otitis, otorrhea and neoplasms.

Department of Pathology

Level III Semester I

COURSE NO. : VPATH 312

Course Title: Systemic Pathology and Oncology

Credit hour : 1

Gross and histopathological studies of diseases, disease conditions and neoplasms of different systems using laboratory specimens, histopathological slides, illustrations and transparencies.

Books recommended (VPATH 311 & 312)

1. *Veterinary Pathology*. By Jones, T.C., Hunt, R.D. and King, N.W. 6th Edition. Williams and Wilkins, Philadelphia, USA. 1997.
2. *Tumors in Domestic Animals*. By Moulton, J.E. 3rd Edition, University of California Press, Berkeley, California, USA. 1990.
3. *Colour Atlas of Histopathology*. By Curran, R.C. 2nd Edition (reprinted). Harvey Miller Publishers, London, England. 1981.
4. *Pathology of Domestic Animals, Vol. 1, 2 and 3*. By Jubb, K.V.F., Kennedy, P.C. and Palmer, N. 4th Edition. Academic Press, Inc., New York, USA. 1993.
5. *Reproductive Pathology of Domestic Mammals*. By McEntee, K. Academic Press, Inc., New York, USA. 1990. *Veterinary Medicine. A Textbook of Diseases of Cattle, Sheep, Pigs, Goats and Horses*. By Radostits, O.M., Gay, C.C., Blood, D.C. and Hinchcliff, K.W. 9th Edition, W.B. Saunders Co. Ltd., London, U.K. . 20

Department of Pathology

Level III Semester II

COURSE NO. : VPATH 321

Course Title: Pathology of Infectious and Non-infectious Diseases

Credit hour : 2

Pathology and Pathogenesis of the following diseases:

Bacterial diseases: Anthrax, black quarter, pasteurellosis, clostridial infections, strangles, glanders, colibacillosis, brucellosis, campylobacteriosis, tuberculosis, paratuberculosis, actinomycosis, actinobacillosis, shigellosis, listeriosis, leptospirosis, dermatophillosis, leprosy.

Viral diseases: Rinderpest, hog cholera, peste des petits ruminants, foot and mouth disease, bovine virus diarrhea-mucosal disease complex, ephemeral fever, infectious bovine rhinotracheitis, rabies, pseudorabies, infectious canine hepatitis, canine distemper, pox, papillomatosis, prion diseases.

Parasitic diseases: Fascioliasis, stomach worm infection, hookworm infection, stephanofilariasis, ascariasis and other nematodiasis, coccidiosis, toxoplasmosis, babesiosis, trypanosomiasis, trichomoniasis, hydatidosis and other tapeworm infections, mite infections.

Fungal diseases: Rhinosporidiosis, coccidioidomycosis, cryptococcosis, ringworm, aspergillosis, candidiasis, histoplasmosis, blastomycosis.

Diseases caused by Mycoplasma: Bovine pleuropneumonia, contagious caprine pleuropneumonia, infectious bovine keratoconjunctivitis, enzootic pneumonia of calves, bovine mycoplasmal arthritis, swine mycoplasmal arthritis and polyserositis.

Diseases caused by Rickettsia: Q fever, salmon disease of dogs and foxes, “Heartwater” of cattle, sheep and goats, anaplasmosis, haemobartonellosis, eperythrozoonosis.

Diseases caused by Chlamydia: Psittacosis, sporadic bovine encephalomyelitis, enzootic abortion of ewes, chlamydial abortion in cattle, chlamydial pneumonia of cattle and sheep.

Diseases caused by extraneous poisons: Classification of extraneous poisons on the basis of pathologic features. Pathology of snake venoms, arsenic, urea, oleander, copper, carbon tetrachloride, gossypol, vetch, sulfonamides, selenium, dicoumarin, bracken fern, nitrate, nitrite, kale, rape, mycotoxins, organophosphates, strychnine, lathyrus, coffee senna, coyotillo.

Nutritional and metabolic diseases: Deficiencies of fat soluble and water soluble vitamins; deficiencies of calcium, phosphorous, iron, copper, zinc, iodine; deficiency of protein; ketosis, milk-fever, grass tetany, rickets, osteomalacia, fibrous osteodystrophy.

Books recommended :

1. *Veterinary Pathology*. By Jones, T.C., Hunt, R.D. and King, N.W. 6th Edition. Williams and Wilkins, Philadelphia, USA. 1997.
2. *Pathology of Domestic Animals, Vol. 1, 2 and 3*. By Jubb, K.V.F., Kennedy, P.C. and Palmer, N. 4th Edition. Academic Press, Inc., New York, USA. 1993.
3. *Veterinary Medicine. A Textbook of Diseases of Cattle, Sheep, Pigs, Goats and Horses*. By Radostits, O.M., Gay, C.C., Blood, D.C. and Hinchcliff, K.W. 9th Edition, W.B. Saunders Co. Ltd., London, U.K. 2000.

Department of Pathology

Level IV Semester I

COURSE NO. : VPATH 411

Course Title: Poultry Pathology

Credit hour : 2

Introduction: Present situation of poultry diseases in Bangladesh

Bacterial diseases: Salmonellosis, colibacillosis, pasteurellosis, infectious coryza, tuberculosis, streptococcosis, staphylococcosis.

Viral diseases: Infectious bursal disease, Newcastle disease, Marek’s disease, avian leucosis, fowl pox, infectious bronchitis, infectious laryngotracheitis, avian influenza, chicken infectious anemia, egg drop syndrome, duck plague, duck viral hepatitis, viral arthritis.

Parasitic diseases: Ascariidiasis and other nematodiasis, tapeworm infections, coccidiosis, infestation by ectoparasites.

Fungal diseases: Aspergillosis, thrush, candidiasis.

Mycoplasmal and chlamydial diseases: Avian mycoplasmosis, avian chlamydiosis

Non-infectious diseases: Deficiencies of fat soluble and water soluble vitamins; deficiencies of calcium, phosphorous, copper, zinc; deficiencies of amino acids and protein, calories, water; common vices; mycotoxicoses and other poisonings.

Diseases of complex or unknown etiology: Gout, multicausal respiratory disease, hydropericardium-hepatitis syndrome, ascites and right ventricular hypertrophy, enteric disease complex, spiking mortality syndrome.

Department of Pathology

Level IV Semester I

COURSE NO. : VPATH 412

Course Title: Poultry Pathology

Credit hour : 1

Investigation of poultry diseases; on-farm investigation, post mortem examination & interpretations, and laboratory investigation.

Study of various poultry diseases using laboratory specimens, histopathological slides, illustrations and transparencies.

Books recommended (VPATH 411 & 412)

1. *Diseases of Poultry*. By Calnek, B.W., Barnes, H.J., Beard, C.W., McDougald, L.R. and Saif, Y.M.[Editors]. 10th edition. Iowa State University Press, Ames, Iowa, USA. 1997.
2. *Poultry Diseases*. By Jordan, F.T.W. and Pattison, M. [Editors]. 4th edition. W.B. Saunders Co. Ltd. London, UK. 1996.
3. *Avian Disease Manual*. By Charlton, B.R. [Editor]. 5th edition. American Association of Avian Pathologists, Pennsylvania, USA. 2000.
4. *Poultry Diseases, Diagnosis and Treatment*. By Chauhan, H.B.S. and Roy, S. New Age International (P) Ltd. Publishers, New Delhi, India. 1996.

5. *Avian Histopathology*. Riddell, C. The American Association of Avian Pathologists. University of Pennsylvania, USA. 1987.

Department of Pathology

Level V, Semester I

COURSE NO. : VPATH 512

Course Title: Clinical Pathology and Necropsy

Credit hour : 1

Clinical Pathology

Introduction : Definition and scope of clinical pathology and necropsy, setting up a clinical pathology laboratory, cleaning and maintenance of glassware and instruments used in clinical pathology, preparation of various buffers, stains, and reagents

Clinical hematology: Methods of collection of blood, serum and plasma. Routine hematological tests - total erythrocyte count, total leucocyte count, differential leucocyte count, hemoglobin estimation, erythrocyte sedimentation rate, packed cell volume, tests for coagulation disorders; interpretation of hematological findings in animals and birds.

Clinical biochemistry: Tests for heart, muscles, liver, kidney, pancreas and bone function with their interpretations.

Clinical tests for urine and their interpretations

Clinical diagnosis of parasitic diseases: Qualitative and quantitative examination of fecal samples.

Examination of skin scrapings

Clinical laboratory diagnosis of bacterial and fungal infections: Methods of sample collection, culture, common staining and antibiotic sensitivity tests.

Techniques of Immunodiagnosis: ELISA, agar gel precipitation test, haemagglutination and haemagglutination inhibition tests.

Collection and examination of biopsy materials and clinical cytology

Methods of writing clinical report.

Necropsy

Techniques of postmortem examination of animals and poultry; interpretations of post mortem findings

Selection, collection, preservation and shipment of pathological specimens to the diagnostic laboratories for diagnosis of specific disease or disease conditions

Methods of disposal of carcasses

Methods of recording of necropsy findings and writing report.

Books recommended :

Outline of Veterinary Clinical Pathology. By Benjamin, M.M. 3rd Edition. The Iowa State University Press, Iowa, USA. 1978.

1. *Veterinary Clinical Pathology*. By Coles, E.H. 3rd Edition. W. B. Saunders Company. 1980.

2. *Manual of Veterinary Investigation. Laboratory Techniques. Vol. 1 and 2*. MAFF/ADAS Reference Book 389 and 390. HMSO, London. 1984.

3. *Manual of Veterinary Clinical Pathology*. By Coffin, D.L. 3rd Edition. Comstock Publishing Association, A Division of Cornell University Press, USA. 1953.

Department of Pharmacology

Level-2, Semester-2

COURSE NO: VPHA-221

Course Title: General Pharmacology and Chemotherapeutics

Credit hour: 3

General Pharmacology:

Introduction and evolution of Pharmacology, drug nomenclature and classification, sources and routes of drug administration, Pharmacodynamics and Pharmacokinetics of drugs, drug dose & dosage, Prescription writing, drug incompatibilities & adverse drug effects.

Chemotherapeutic drugs:

Antibacterial agents: General considerations, sulfonamides, trimethoprim, penicillins, cephalosporins, aminoglycosides, tetracyclines, macrolides, fluroquinolones and miscellaneous, antibiotics, antifungal and antiviral drug, antiseptics and disinfectants.

Antiparasitic agents: Antinematodal, anticestodal, antitrepatodal and antiprotozoal drugs and ectoparasiticides.

Antineoplastic and immunomodulatory agents.

Department of Pharmacology

Level-2, Semester-2

COURSE NO: VPHA-222

Course Title: General pharmacology and Chemotherapeutics

Credit hour: 1

Weights and Measures:

Identification, preparation and study of the actions and dosages of common veterinary drugs. Study the action of drugs on laboratory animals, isolated heart of mammals and amphibians.

Study of the actions of drugs on anesthetized animals.

Books Recommended (VPHA 221 & 222)

1. Veterinary Pharmacology And Therapeutics: H. Richard Adams, 8th Edition 2001, Iowa State University Press/Ames, and U.S.A.
2. Veterinary Applied Pharmacology And Therapeutics: G.C Brander, D.M. Pugh, R.J. Bywater & W.L Jenkins. 5th Edition 1991 ELBS with Bailliere Tindall, U.K.
3. Goodman And Gillman's The Pharmacological Basis of Therapeutics: Alfred Goodman Gilman, Louis S. Goodman and Alfred Gilman. 10th Edition, 2001. Macmillan Publishing Co. Inc. New York.
4. Basic & Clinical Pharmacology: Bertram G. Katzung. 8th Edition 2000. McGraw-Hill Medical Publishing Division, New York.

Department of Pharmacology

Level-3, Semester-1.

COURSE NO: VPHA-311

Course Title: Systemic Pharmacology

Credit hour: 3

Alimentary System: Introduction, sialogogues, anti- sialogogues, emetics, anti- emetics, demulcents, stomachics, carminatives, Antizymotics, intestinal astringents, laxatives, purgatives and anti- diarrhoeal agents.

The Heart and circulatory system: introduction, drugs affecting myocardial contractility and rhythmicity, drug affecting heart, vasculature and peripheral circulation.

Respiratory System: Introduction, expectorants, antitussives, bronchodilators, membrane shrinking drugs and respiratory stimulants.

Urinary System: Introduction, anti-diuretics, diuretics, urinary antiseptics and drug used in kidney study.

Autonomic Nervous System: Introduction, sympathomimetics, sympatholytics, parasymphomimetics, parasympholytics and ganglionic blocking. drugs.

Central Nervous System: Introduction CNS stimulants, depressants, anesthetics –local, regional and general.

Endocrine and Nutritional Pharmacology: Introduction, hormones & drugs affecting growth, reproduction and metabolism. Fat and water-soluble vitamins, minerals and miscellaneous nutrients.

Haematopoietic System: Introduction, anti-anemic, haemostatic, and anti-coagulant drugs.

Dermatologic and Ophthalmic Pharmacology: Introduction, drugs affecting skin, mucous membranes, ears and eyes.

Prophylactic Pharmacology: Introduction, vaccine, antisera, and diagnostic agents.

Miscellaneous Drugs: Autacoids and anti-inflammatory drugs with special reference to histamine, peptide, prostaglandin and non-steroidal anti-inflammatory drugs.

Books Recommended

1. Veterinary Pharmacology And Therapeutics: H. Richard Adams, 8th Edition 2001, Iowa State University Press/ Ames, U.S.A.
2. Veterinary Applied Pharmacology And Therapeutics: G.C Brander, D.M. Pugh, R.J. Bywater & W.L Jenkins. 5th Edition 1991 ELBS with Bailliere Tindall, U.K.
3. Goodman And Gillman's The pharmacological Basis of Therapeutics: Alfred Goodman Gilman, Louis S. Goodman and Alfred Gilman. 10th Edition, 2001. Macmillan Publishing Co. Inc. New York.
4. Basic & Clinical Pharmacology: Bertram G. Katzung. 8th Edition 2000. McGraw-Hill Medical Publishing Division, New York.

Department of Pharmacology

Level-5, Semester-1

COURSE NO: VPHA-512

Course Title: Clinical Pharmacology and Pharmacy.

Credit hour : 1

Collection, preparation, packaging and preservation of solution, suspension, capsules, tablet, paste, emulsion, ointment, etc..
Compounding and dispensing of various preparations.

Pharmaceutical dosage forms and packaging.

Collection, identification and use of common indigenous medicinal plants.

Techniques used for the assessment of antibiotics, anthelmintics, anti-inflammatory drugs, antiseptics and other common drugs. Clinical aspects of rational safe and effective drug therapy. Drug therapy of individual disease, introduction of new medicines.

Books Recommended

1. Veterinary Applied Pharmacology And Therapeutics: G.C Brander, D.M. Pugh, R.J. Bywatre & W.L Jenkins. 5th Edition 1991 ELBS with Bailliere Tindall, U.K.
2. Goodman And Gillman's The pharmacological Basis of Therapeutics: Alfred Goodman Gilman, Louis S. Goodman and Alfred Gilman. 10th Edition, 2001. Macmillan Publishing Co. Inc. New York.
3. Basic & Clinical Pharmacology: Bertram G. Katzung. 8th Edition 2000. McGraw-Hill Medical Publishing Division, New York
4. Cooper and Gunn's Tutorial Pharmacy: S.J. Carter. 6th Edition, 2000. CBS Publishers & Distributors, New Delhi-110002, India.
5. Introduction to Pharmaceutics-1: Ashok K. Gupta. 3rd Edition, 1994. CBS Publishers & Distributors, New Delhi-1100002, India.
6. Theory and Practice of Industrial Pharmacy: Lion Lachman, Herbert A. Lieberman, Joseph L. Kanig. 4th Edition India reprint, 1994.
7. Clinical Pharmacology: P.N. Bennett and M.J. Brown. 9th Edition 2004. Churchill Livingstone.

Department of Pharmacology

Level-4, Semester-2.

COURSE NO: VPHA-321

Course Title: Toxicology

Credit hour: 3

Introduction, different areas of toxicology, toxicological terminology. Classification, metabolism and mode of action of poisons, factors altering the action of poisons, common causes, diagnosis and general treatment of poisoning.

Chemical and Phytotoxicology: Study of sources, toxicity, mechanism of toxic action, symptoms, diagnosis, treatment and prevention of the following:

(i) **Inorganic poisons:** Acids and alkalis, urea, antimony, arsenic, carbon monoxide, sodium chloride, copper, halogen compounds, lead, mercury, molybdenum, selenium and zinc.

(ii) **Organic poisons:** Anesthetics, sympatho and parasympathomimetics, anthelmintics, antibiotics and sulfonamides.

(iii) **Pesticides:** Botanical insecticides, organochlorine, organophosphate and organocarbamate compounds, fungicides, herbicides, rodenticides and acaricides.

(vi) **Poisonous plants:** Cyanogenetic and estrogenic plants. Mycotoxins including aflatoxins and ergot. Deferent species of the genera Nerium, Thevetia, Datura, Strychnos, Abrus, Ricinus, Calotropis/Asclapias, Nicotiana, Digitalis, Papever, Cannabis, Lathyrus, Aconitum, Conium and Gossypium.

Environmental Toxicology:

Various agents causing environmental pollution, i.e. soil, air and water pollution. Food additives and contaminants. Drug and chemical residues in the edible tissues of animals. Radiation and radioactive materials. Green house effects.

Miscellaneous Poisons : Plants and chemical producing teratogenic, mutagenic, carcinogenic and allergic conditions

Department of Pharmacology

Level-3, Semester-2

COURSE NO: VPHA-322

Course Title: Toxicology

Credit hour: 1

Identification and study of common poisonous plants. Collection and sending of materials for toxicological analysis.

Laboratory diagnosis of poisons-volatile, non-volatile and metallic poisons including cyanides, nitrate, arsenic and mercury etc.

Chemical antagonism : Arsenic and dimercaprol (BAL)/sodium thiosulphate.

Physiological and Pharmacological antagonism: Organophosphate and atropine. Anticonvulsant and life saving effect of pentobarbital in experimental strychnine poisoning. Methemoglobin former as antidote to cyanide poisoning. Methylene blue and nitrate poisoning.

Books Recommended: (VPHA-321 & 322)

1. Veterinary Toxicology: M.L. Clarke, D.G. Harvey and D.J. Humphreys. 2nd edition, 1981. ELBS, Bailliere Tindall.
2. Cassarett and Doulls Toxicology: J. Doull, C.D. Klassen and O. Amdur, Sixth edition, 2001/. Macmillan Publishing Co. Inc. New York.
3. Clinical Veterinary Toxicology: G. Lorgue, J. Lechenet and A. Riviere. 1st edition,1996. Blackwell Science Inc. Cambridge, U.S.A.
4. Loom's Essentials of Toxicology: T.A. Loomis and A.W. Hayes. 4th edition.1996 Academic Press.
5. Veterinary Toxicology: S.K. Gary. 1st edition 2003(reprint). CBS publishers, New Dellhi, India.
6. Medical and Public Health Laboratory Methods: James Stivens Simons and Cleon J. Gentzkow. 5th edition 1988. Lea and Febiger Philadelphia.

Department of Medicine

COURSE NO. VM 311

Course Title: Clinical Methodology

Credit hour: 2

A. Introduction and Clinical examination

a) Definition, aim, objective, scope and history of clinical veterinary medicine and its relationship with other field and laboratory disciplines. Concepts of health and disease. Causes of disease (direct and indirect, biological and non-biological causes). Definition of common clinical terms. Diagnostic terms – definition and scope.

b) Introduction to different techniques/methods (general and special) of clinical examination of animals, History taking, examination of the environment and examination of the animal. General examination – distant and close examination, physical examination of body regions and systems, Animal restraint – objective and methods of restraint. Clinical signs – Definition, classification, methods of detection and identification of clinical signs of diseases of different organ-systems of animals. Interpretation of significant clinical findings for diagnosis. Physical examination findings of clinical specimens.

B. Diagnosis and treatment

Definition and types of diagnosis, principles of diagnosis, principles and basis of different types of diagnosis. Methods and steps of diagnosis. Indications and limitations of field and laboratory diagnosis.

General principles of treatment, definition and scope of different types of treatment, factors of consideration in the treatment of food and non-food animals. Principles of selection of drugs and determination of dose, route, frequency and duration of treatment. Alternative medicine used in clinical and population veterinary practices.

General systemic states – Disturbances of appetite, food intake and nutritional states-ill thrift, pica; stress, septicemia, hypothermia, hyperthermia, fever, toxemia, shock. Dehydration, electrolyte and acid-base imbalance.

Department of Medicine

COURSE NO. VM 312

Course Title: Clinical Methodology

Credit hour: 1

Maintenance of records of everything done in the practical sessions in a practical note book to be checked and signed by teacher(s) concern.

1. Introduction: Scope of veterinary hospital and clinical practice, requirements and responsibility of veterinary clinician.
2. Methods of animal restraint: General and regional.
3. Demonstration of clinical instruments: Diagnostic (including animal restraint) and therapeutic instruments.
4. Demonstration of general (including modified forms) and special physical examination techniques used in different organ-systems of domestic animals (healthy).
5. Handling of clinical cases: General principles and procedures of clinical / physical examination in domestic animals. Demonstration of condition of distant inspection and physical examination.
6. General principles and procedure of clinical history taking and distant inspection. Demonstration of demeanour and physical condition of animals.
7. Clinical investigation of disease in individual sick animals: Clinical history taking, demonstration of methods and procedures of detection, identification and interpretation of clinical findings in making presumptive diagnosis, prognosis and clinical advice. Procedure of filling up of clinical investigation record forms.
8. Clinical specimens: Demonstration of the methods of collection, physical examination, preservation and dispatch of specimens (feces, urine, blood, rumen fluid, abomasal fluid, milk, skin scrapings, plasma, serum, swabs, smears etc) to the laboratory.
9. Demonstration of the methods of administration of drugs: External and internal.
10. Transfusion techniques: Clinical practice on fluid and electrolyte, and blood transfusion in farm animals.
11. Demonstration of drugs, dispensing and prescription writing: Principles and procedures.

Books Recommended (VM 311 & 312)

1. Adams, H.R. (1995). *Veterinary Pharmacology and Therapeutics*. 7th edn. Iowa State University Press, Ames, Iowa.
2. Boddie, G.F. (1956). *Diagnostic Methods in Vet. Medicine*. 4th edn. Oliver and Boyd, London.
3. Gibbons, W. J. (1976). *Clinical Diagnosis of Diseases of Large Animals*. Lea and Febiger, Philadelphia.
4. Jackson, P. and Cockcroft, P.(2002). *Clinical Examination of Farm Animals*. Blackwell Science Ltd.
5. Kelly, W.R. (1984). *Veterinary Clinical Diagnosis*. 3rd edn. Bailliere-Tindall, London
6. Radostits, O.M., Gay, C.C. Blood, D.C., and Hinchcliff, K.W. (2000). *Veterinary Medicine: A textbook of the diseases of cattle, sheep, pigs, goats and horses*. 9th edn. W.B. Saunders Co., Philadelphia.
7. Rosenberger, G. (1979). *Clinical Examination of Cattle*. 2nd edn. Verlag Raul Parry, Berlin and Hamburg.
8. সামাদ,এম,এ,(২০০১). পশু পালন ও চিকিৎসাবিদ্যা, দেশ প্রকাশনা, নং ০৮ বাকুবি, ময়মনসিংহ।

Department of Medicine

COURSE NO. VM 323

Course Title: Systemic Diseases of Farm Animals

Credit hour : 3

A. Diseases of digestive, respiratory and urinary organ-systems

General principles of dysfunction and manifestations, diagnosis and treatment of diseases of digestive, respiratory and urinary systems of domestic ruminants, horses and swines.

Definition, causes, pathophysiology, pathogenesis, clinical characteristics (signalment, anamnesis, nature of onset, clinical signs, course and severity, physical findings of specimens), presumptive diagnosis, prognosis, conservative treatment and nature of response and advice on general diseases (mentioned below) of digestive, respiratory and urinary organs-systems of domestic ruminants, swines and horses.

1. Diseases of upper alimentary tract : Diseases of buccal cavity and associated organs. Diseases of pharynx and esophagus, congenital defects.
2. Diseases of stomach and intestine : Equine and bovine colic, indigestion, rumenal bloat, impaction of omasum and abomasums, abomasal displacements-left, right, torsion, enteritis, dietary diarrhea and acute intestinal obstruction.
3. Disease of liver and peritoneum : Hepatitis, hepatomegaly, jaundice, peritonitis.
4. Diseases of upper respiratory tract : Rhinitis, epistaxis, hemoptysis, laryngitis, laryngeal paralysis, tracheitis, bronchitis.
5. Diseases of lungs and pleura : Pulmonary edema, congestion, emphysema, pneumonia, hydrothorax, hemothorax, pneumothorax, atelectasis and pleurisy (pleuritis).
6. Diseases of urinary system : Nephritis, nephrosis, cystitis, urolithiasis.

B. Diseases of other organ-systems

General principles of dysfunction and manifestations, diagnosis and treatment of diseases of cardiovascular, nervous, musculoskeletal and integumentary systems of farm animals.

Definition, causes, pathogenesis and pathophysiology, clinical characteristics, presumptive diagnosis, prognosis, conservative treatment and nature of response and advice on important general diseases (mentioned below) of other organ-systems – cardiovascular, hemopoietic and lymphatic, nervous and musculoskeletal systems, skin, udder, eye and ear of domestic ruminants, swines and horses.

1. Diseases of hair, wool, follicles, skin, coat and subcutis : Pityriasis, alopecia, hypotrichosis, seborrhea, folliculitis, hyperkeratosis, parakeratosis, pachyderma, urticaria, photosensitization, dermatitis and dermatosis, angioneurotic edema, subcutaneous emphysema, anasarca, subcutaneous cysts.
2. Diseases of udder and teats : Teat papilloma, bovine ulcerative mammillitis, udder impetigo, chaps, theilitis, udder edema, blood in the milk, agalactia.
3. Diseases of eye and ear : Keratitis and conjunctivitis, otitis externa/otorrhea.
4. Diseases of cardiovascular, hemopoietic and lymphatic systems : Heart failure (acute heart failure, congestive heart failure), myocarditis and endocarditis, pericarditis and congenital defects, edema, anemia, lymphadenopathy, splenomegaly.
5. Diseases of nervous system : Encephalitis, meningitis, cerebral hypoxia, hydrocephalus, epilepsy, myelitis.
6. Diseases of musculoskeletal system : Myositis and myopathy, myasthenia, osteodystrophy and osteomyelitis, arthropathy and arthritis.

Department of Medicine

COURSE NO. VM 324

Course Title: Systemic Diseases of Farm Animals

Credit hour : 1

1. Handling of clinical cases : Clinical/physical examination, non-laboratory field-based presumptive diagnosis, prognosis and conservative curative treatment of general diseases, and advice for restoration of health in individual sick farm animals (domestic ruminants, swines and horses).
2. Collection, physical examination, preservation and dispatch of clinical specimens to respective laboratories of the Faculty of Veterinary Science.

- Recording of at least 30 clinical cases with post-treatment evaluation and interpretation in a note book (approved format of the Department concerned) to be checked and signed by teacher(s) concerned.

Books Recommended (VM 323 & 324)

- Aiello, S.E. and Mays, A. (1988). *The Merck Veterinary Mamud*. Merck & Co., Inc, USA.
- Anderson, N.V. (1992). *Veterinary Gastroenterology*. Lea & Febiger, London.
- Andrews, A.H., Blowey, R.W., Boyd, H. and Eddy, R.G. (2004). *Bovine Medicine: Disease and Husbandry of Cattle*. 2nd edn. Blackwell Science.
- Byaher and Natamen, M.C. (1985). *Veterinary Fluid Therapy*. Blackwell Science.
- Howard, L.J. (1993). *Current Vet. Therapy: Food Animal Practice*. W.B. Saunders Co. Philadelphia.
- Mathews, J. (1999). *Diseases of the Goat*. Blackwell Science.
- Radostitis, O.M., Gay, C.C., Blood, D.C. and Hincheliff, K.W. (2000), *Veterinary Medicine: A Textbook of the Diseases of Cattle, Sheep, Pigs, Goats and Horses*, 9th edn. W.B. Saunders Co. Philidelphia.
- Smith, B.P. (1996). *Large Animal Internal Medicine*. 2nd edn. C.V. Mosby Co., St. Louis, Philadelphia.
- সামাদ,এম,এ,(২০০১). পশু পালন ও চিকিৎসাবিদ্যা, দেশ প্রকাশনা, নং ০৮ বাকুবি, ময়মনসিংহ।

Department of Medicine

COURSE NO. VM 421

Course Title: Infectious Diseases of Farm Animals

Credit hour: 3

A. Diseases of Cattle and Buffaloes

Definition, causes, pathophysiology/ pathogenesis, clinical characteristics (signalment, anamnesis, nature of onset, clinical signs, course and severity, physical findings of specimens), presumptive diagnosis, prognosis, conservative treatment and nature of response and clinical advice on important infectious and parasitic diseases (listed below) of domestic cattle and buffaloes of Bangladesh.

- Bacterial diseases : Mastitis, anthrax, pasteurellosis (pneumonic, septicemic-HS), colibacillosis, salmonellosis, clostridial diseases (tetanus, black leg, black disease, bacillary hemoglobinuria, malignant edema, botulism, enterotoxemia), actinomycosis, actinobacillosis, tuberculosis, Johne's disease, navel ill, posthitis, contagious bovine pyelonephritis, brucellosis, vibriosis, leptospirosis, listeriosis, foot rot, dermatophilosis, infectious bovine keratoconjunctivitis.
- Mycoplasmal, rickettsial, chlamydial and fungal diseases : Contagious bovine pleuropneumonia, anaplasmosis, Q-fever, tick borne fever, contagious ophthalmia, contagious agalactia, rhinosporidiosis, dermatophytosis, Degnala disease, cryptococcosis, candidiasis.
- Viral diseases : Foot and mouth disease, ephemeral fever, rabies, rinderpest, bovine virus diarrhea, infectious bovine rhinotracheitis, rota virus infection, bovine malignant catarrhal fever, winter dysentery, papillomatosis, cowpox, buffalopox.
- Protozoan diseases : Babesiosis, theileriosis, coccidiosis, cryptosporidiosis, balantidiasis, trypanosomiasis, trichomoniasis.
- Helminth diseases : Hydatid disease, lungworm disease, fascioliasis, intestinal amphistomiasis, schistosomiasis (nasal and intestinal), ascariasis, strongyloidosis, stephanofilariasis, parasitic gastro-enteritis, tape worm infection.
- External parasitic infestation : Lice, tick and mite infestations.

B. Diseases of Goats, Sheep, Swines and Horses

Definition, causes, pathophysiology, pathogenesis, clinical characteristics (signalment, anamnesis, nature of onset, clinical signs, course and severity, physical findings of specimens), presumptive diagnosis, prognosis, conservative treatment and nature of response and clinical advice on important infectious and parasitic diseases (listed below) specific to domestic goat, sheep, swine and horse in Bangladesh.

- Diseases of sheep and goat : Enterotoxemia, tetanus, caseous lymphadenitis, parasitic gastroenteritis, parasitic otitis, fascioliasis, cerebral and extraneural encephalitis, tapeworm infection, tick pyemia, external parasitic infestation (sheep ked infestation, different types of mange), blue tongue, contagious ecthyma, PPR, louping ill, scrapie, sheeppox, goatpox, pulmonary adenomatosis and ovine progressive pneumonia.
- Diseases of horse : Strangles, glanders, ulcerative lymphangitis, exertional rhabdomyolysis/azoturia, nutritional disease, parasitic gastroenteritis, habronemiasis, equine infectious anemia, equine influenza.
- Diseases of swine : Hog cholera, vesicular stomatitis, pseudorabies, swine fever, swine dysentery, parasitic gastroenteritis, piglet anemia, parakeratosis, erysipelas.

Department of Medicine

COURSE NO. VM 422

Course Title: Infectious Diseases of Farm Animals

Credit hour: 1

1. Handling of clinical cases : Clinical / physical examination, non-laboratory presumptive diagnosis, prognosis and conservative treatment of special diseases and clinical advice for restoration of health in individual sick farm animals (domestic ruminants, swines and horses).
2. Collection, physical examination, preservation and dispatch of clinical specimens to respective laboratories of the Faculty of Veterinary Science.
3. Recording of at least 30 clinical cases with post-treatment evaluation and interpretation in a note book (approved format by the Department concern) to be checked and signed by teacher(s) concern.
4. Visit to Rajarbagh police horse farm, camel farm (Dhaka), Savar dairy farm during Thursdays using ambulatory clinic of BAU vet. clinic.

Books Recommended (VM 421 & 422)

1. Aiello, S.E. and Mays, A. (1988). The Merck Veterinary Manual. Merck & Co., Inc, USA
2. Anderson, N.V. (1992). Veterinary Gastroenterology. Lea & Febiger, London.
3. Andrews, A.H., Blowey, R.W., Boyd, H. and Eddy, R.G. (2004). Bovine Medicine: Disease and Husbandry of Cattle. 2nd edn. Blackwell Science Ltd.
4. Byaher and Natamen, M.C. (1985). Veterinary Fluid Therapy. Blackwell Science Ltd.
5. Cockrill, W.R. (1974). The Husbandry and Health of Buffalo. FAO, Rome.
6. Howard, L.J. (1993). Current Veterinary Therapy : Food Animal Practice. W.B. Saunders Co., Philadelphia.
7. Mathews, J. (1999). Diseases of the Goat. Blackwell Science Ltd.
8. Radostitis, O.M., Gay, C.C., Blood, D.C. and Hinchcliff, K.W. (2000), Veterinary Medicine : A Textbook of the Diseases of Cattle, Sheep, Pigs, Goats and Horses. 9th edn. W.B. Saunders Co., Philadelphia.
9. Smith, B.P. (1996). Large Animal Internal Medicine. 2nd edn. C.V. Mosby Co., St. Louis, Philadelphia.
10. সামাদ,এম,এ,(২০০১). পশু পালন ও চিকিৎসাবিদ্যা, দেশ প্রকাশনা, নং ০৮ বাকুবি, ময়মনসিংহ।

Department of Medicine

COURSE NO. VM 413

Course Title: Metabolic and Nutritional Diseases of Farm Animals

Credit hour: 2

Metabolic diseases

Definition of metabolic and production diseases and their differences, Compton metabolic profile test, differential diagnosis of common causes of recumbency in parturient adult cattle, Milk fever, downer cow syndrome, bovine ketosis, pregnancy toxemia, fat cow syndrome, acute hypokalemia in cattle, neonatal hypoglycemia, grass tetany, lactation tetany, hypophosphataemia, post-parturient hemoglobinuria, azoturia.

Nutritional diseases

Protein-energy deficiency diseases, vitamin-mineral deficiency diseases (vitamin A, D, E, B₁₂, calcium, phosphorus, magnesium, cobalt, copper, iodine, iron, manganese, zinc, selenium deficiency diseases), rickets, osteomalacia, osteodystrophia fibrosa.

Diseases caused by chemicals, poisons, toxins

Organophosphorus and carbamates poisoning, chlorinated hydrocarbon poisoning, nitrate and nitrite poisoning, hydrocyanic acid poisoning, arsenic and lead poisoning, urea poisoning, oxalate poisoning, poisoning by anthelmintics, snake bite, bee stings, tick paralysis.

Diseases caused by physical agents

Lightning stroke and electrocution, burns and scalds, yoke gall, brisket disease.

Books Recommended

1. Aiello, S.E. and Mays, A. (1988). The Merck Veterinary Manual. Merck & Co., Inc, USA
2. Andrews, A.H., Blowey, R.W., Boyd, H. and Eddy, R.G. (2004). Bovine Medicine: Disease and Husbandry of Cattle. 2nd edn. Blackwell Science Ltd.
3. Byaher and Natamen, M.C. (1985). Veterinary Fluid Therapy. Blackwell Science Ltd.
4. Cockrill, W.R. (1974). The Husbandry and Health of Buffalo. FAO, Rome.
5. Howard, L.J. (1993). Current Veterinary Therapy : Food Animal Practice. W.B. Saunders Co., Philadelphia.
6. Mathews, J. (1999). Diseases of the Goat. Blackwell Science Ltd.
7. Radostitis, O.M., Gay, C.C., Blood, D.C. and Hinchcliff, K.W. (2000), Veterinary Medicine : A Textbook of the Diseases of Cattle, Sheep, Pigs, Goats and Horses. 9th edn. W.B. Saunders Co., Philadelphia.
8. Smith, B.P. (1996). Large Animal Internal Medicine. 2nd edn. C.V. Mosby Co., St. Louis, Philadelphia.
9. সামাদ,এম,এ,(২০০১). পশু পালন ও চিকিৎসাবিদ্যা, দেশ প্রকাশনা, নং ০৮ বাকুবি, ময়মনসিংহ।

Department of Medicine

COURSE NO. VM 411

Course Title: Small, Zoo and Laboratory Animal Medicine

Credit hour : 3

A. Small Animal Medicine

Definition, causes, pathophysiology, pathogenesis, clinical characteristics (signalment, anamnesis, nature of onset, clinical signs, course and severity, physical findings of specimens), presumptive diagnosis, prognosis, conservative treatment and nature of response and clinical advice on the following important general and special diseases of pet dogs and cats in Bangladesh.

General diseases

1. General systemic states--Hyperthermia, hypothermia, toxemia, weakness, syncope, obesity, cachexia.
2. Digestive disorders-anorexia, inappetance, polyphagia, ptyalism, vomiting, diarrhea, constipation, dysentery, gastroenteritis.
3. Respiratory disorders – sneezing, nasal discharge, coughing, tachypnea, dyspnea.
4. Urogenital disorders – Genital discharges, polyuria, polydipsia, urinary incontinence, urine retention, discolourtion of urine, proteinuria.
5. Cardiovascular disorders-Abnormal heart sounds and pulse, hypotension, hypertension. Hemopoietic disorder – Anemia, polycythemia, cyanosis, jaundice, epistaxis, hemoptysis.
6. Neurological disorders–Shivering, trembling, ataxia, paresis, coma, stupor, seizures, abnormal behaviour.
7. Endocrine and musculoskeletal disorder—Acromegaly, diabetes, hypothyroidism, lameness, swollen joint.
8. Diseases of eye and ear.
9. Skin diseases: alopecia, pruritus, skin lesions, erosive and ulcerative dermatitis.

Special diseases

1. Viral diseases : Canine distemper, canine hepatitis, rabies, canine parvovirus and coronavirus infection, feline panleukopenia, kennel cough, feline leukemia, feline infectious anemia, feline rhinotracheitis.
2. Bacterial diseases: Salmonellosis, campylobacteriosis, tuberculosis, pseudotuberculosis, brucellosis, leptospirosis, actinomycosis, tetanus, botulism, Tyzzer's disease, tularemia, borreliosis, lyme disease, streptococcosis, cat scratch disease, bubonic plague.
3. Fungal diseases : Dermatophytosis, candidiasis, moniliasis, histoplasmosis, cryptococcosis, aspergillosis.
4. Parasitic diseases : Protozoan diseases – Coccidiosis, cryptosporidiosis, amebiasis, giardiasis, toxoplasmosis, babesiosis, trypanosomiasis, leishmaniasis, sarcocystosis, Helminth diseases – Heart worm disease, ascariasis, hookworm disease, strongyloidosis, tape worm disease, whipworm disease, giant kidney worm disease, esophageal and stomach worm disease, trichinellosis, External parasitic infestation – Lice, tick, flea and mite infestations.
5. Non-infectious diseases : a) Nutritional deficiency diseases, b) Diseases caused by physical and chemical agents, immunological disorders and cancer.

B. Zoo and Laboratory Animal Medicine

1. Introduction, history and scope of Zoo and Laboratory Animal Medicine. Requirements for zoo veterinarians, Definition of related terms. Epidemiological significance of zoological gardens.
2. Animal status in different zoo in Bangladesh, ethology (behaviour) and stress in zoo animals and birds.
3. Restraint - different methods and adverse effects of restraint.
4. Principles of diagnosis of diseases of zoo and laboratory animals - dispatch of samples to the laboratory and laboratory methods of diagnosis.
5. Health management of different zoo and laboratory animals.
6. Classification, biological characteristics, feeds and feeding, restraint and handling and important diseases of common species of zoo animals and birds of the following orders, Aves, Reptiles and mammals (Marsupialia, Edentata, Chiroptera, Non-human primates, Lagomorpha, Rodentia, Carnivora, Proboscidea, Perissodactyla and Artiodactylia).
7. Principles of nutrition and nutritional deficiency diseases in zoo animals and birds with their treatment and prevention.
8. Zoonotic diseases of zoo and laboratory animals and birds and their prevention and control.

Department of Medicine

COURSE NO. VM 412

Course Title: Small, Zoo and Laboratory Animal Medicine

Credit hour: 1

Small Animal Medicine

1. Introduction and requirements of small animal clinic and responsibilities of the small animal practioners.
2. Methods of restraining of dogs, cats and zoo and laboratory animals and birds.
3. Methods of clinical diagnosis of diseases of dogs and cats- History taking, distant inspection and physical techniques, clinical examination of different body regions and different systems and organs of small animals
4. Methods of laboratory diagnosis-collection, physical examination, preservation and shipment of stools, urine, blood, skin scrapings, smears, swabs and edematous fluid. Diagnostic imaging techniques
5. Demonstration and dispensing of drugs and their doses, route of administration, duration of treatment and adverse drug reactions in dogs and cats.

- Recording of clinical cases of dogs and cats and their prescription writing, post-treatment evaluation and interpretation.
- Field trips to the Central Veterinary Hospital, Dhaka and other private small animal clinic for practical classes.

Zoo and Laboratory Animal Medicine

- Requirement of zoo veterinarians.
- Methods of restraining of zoo and laboratory animals and birds.
- Demonstration of drugs and vaccines used in zoo and laboratory animals with their dose and route of administration.
- Methods of clinical examination, collection and dispatch of specimens to the laboratory for confirmation of diagnosis and treatment of sick zoo and laboratory animals and birds.
- Requirements and planning for establishing an ideal zoological garden and laboratory animal house.
- Preparation of a note book everything done in the practical classes.
- Provision for funds and transport for practical classes in zoological garden in Dhaka zoo and students should prepare and submit the report on practical classes held in zoo during final examination.

Books Recommended (VM 411 & 412)

- Ettinger, S.J. and Feldman, E.C. (1995). *Textbook of Veterinary Internal Medicine: Diseases of the Dog and Cat*. Vol. I, II. 4th edn. W.B. Saunders Co., Philadelphia.
- Gorman, N.T. (1998). *Canine Medicine and Therapeutics*. 4th edn. Blackwell Science Ltd., London.
- Schar, M. (2003). *Canine Medicine of the Dog and Cat*. 2nd edn. Manson Publishing Ltd., London.
- Willard, M., Tvedten, H. and Turnwald, G.H. (1994). *Small Animal Clinical Diagnosis by Laboratory Medicine Methods*. 2nd edn. W.B Saunders Co., Philadelphia.
- Fowler, M.E (1986). *Zoo and Wild Animal Medicine*. 2nd Edn. W.B. Saunders Company, Philadelphia.
- Fowler, ME and RE Miller (2003). *Zoo and Wild Animal Medicine*. 5th edn., Saunders, USA.
- Fowler, M.E (1996). *Restraint and Handling of Wild and Domestic Animals*. Iowa State University Press, Ames, Iowa.
- Holmes, D.D. (1988). *Clinical Laboratory Animal Medicine*. Iowa State University Press, Ames, Iowa.
- Klos, H.G. and Lang, E.M., (1982) *Handbook of Zoo Medicine*. Van Nostrand Reinhold Company, New York, London, Toronto, Melbourne.
- Samad, M. A. (2000). *Veterinary Practitioner's Guide*, 1st pub. LEP Pub No. 7, BAU, Mymensingh

Department of Medicine

COURSE NO. VM 512

Course Title: Clinics (Medicine)

Credit hour : 1

- Handling of clinical cases : Clinical/physical examination, non-laboratory field-based presumptive diagnosis, prognosis and conservative treatment of both general and special diseases and clinical advice for restoration of health in individual sick animals and birds attended at Veterinary Clinic of BAU.
- Collection, physical examination and dispatch of specimens to the laboratory.
- Preparation of a note book which will include a) recording of 30 clinical cases with post-treatment evaluation and interpretation (approved format prescribed by the department concern). The note book is to be checked and signed by teacher(s) concern.

Books Recommended

- Aiello, S.E. and Mays, A. (1988). *The Merck Veterinary Manual*. Merck & Co., Inc, USA
- Burr, E.W. (1987). *Companion Bird Medicine*. Iowa State University Press, Ames, Iowa.
- Ettinger, S.J. and Feldman, E.C. (1995). *Textbook of Veterinary Internal Medicine: Diseases of the Dog and Cat*. Vol. I, II. 4th edn. W.B. Saunders Co., Philadelphia.
- Howard, L.J. (1993). *Current Veterinary. Therapy: Food Animal Practice*. W.B. Saunders Co., Philadelphia.
- Radostitis, O.M., Gay, C.C., Blood, D.C. and Hinchcliff, K.W. (2000), *Veterinary Medicine: A Textbook of the Diseases of Cattle, Sheep, Pigs, Goats and Horses*. 9th edn. W.B. Saunders Co., Philadelphia.
- সামাদ,এম,এ,(২০০১). পশু পালন ও চিকিৎসাবিদ্যা, দেশ প্রকাশনা, নং ০৮ বাকুবি, ময়মনসিংহ।

Department of Medicine

COURSE NO. VM 321

Course Title: Epidemiology and Preventive Medicine

Credit hour : 3

A. Principles and Methods of Epidemiology and Ecology

Definition, objectives, uses, history and basic concepts of epidemiology. Definition of common epidemiologic and population medicine terms. Causation of disease in population - multifactorial theory of disease, Evan's postulates, necessary and sufficient causes. Determinants of diseases – demographic, animal production and managerial, environmental and pathogen factors. Temporal patterns of disease occurrence and trends. Veterinary ecology – principles and methods, mode of transmission of infection and disease process in population, infection dynamics.

Measurements of health and disease in population – morbidity, mortality rate, case fatality rate, attack rate, prevalence, incidence rate, measurement of productivity. Descriptive epidemiology – survey, surveillance and monitoring of health and disease. Explanatory epidemiology and ecology – principles and methods of observational and experimental studies, analysis and demonstration of association and identification of risk factors. Epidemiologic investigation of sporadic, endemic, epidemic and pandemic diseases. Principles of risk analysis, assessment and management. Livestock development programs – planning, execution and evaluation.

B. Preventive Veterinary Medicine

Introduction- Definition, aim, objectives of preventive vet. medicine. Principles and methods of disease prevention and control. Planning, execution and evaluation of disease management programs in population : management of risk factors, biosecurity, hygienic measures, vaccination, prophylaxis, early diagnosis and treatment, disease control. Disease emergencies – nature and potential consequence, emergency preparedness, reporting and information systems. Management of important diseases of the animals – prevention, control, eradication and elimination with particular reference to List A, List B (TAD) and List C diseases.

List A diseases : Mastitis, salmonellosis, colibacillosis, clostridial diseases, parasitic, metabolic & nutritional diseases.

List B diseases (Transboundary Animal Diseases, TAD) : Foot and mouth disease, PPR, rinderpest, sheep and goat pox, contagious bovine pleuropneumonia, hog cholera, swine fever, swine vesicular disease, vesicular stomatitis, lumpy skin disease, blue tongue, rift valley fever, african horse sickness.

List C diseases : Anthrax, dermatophilosis, hemorrhagic septicemia, babesiosis, theileriosis, rabies, Johne's disease, tuberculosis, brucellosis, leptospirosis, campylobacteriosis, infectious bovine rhinotracheitis, anaplasmosis, screw-worm diseases heartwater, enzootic bovine leukosis, bovine spongiform encephalopathy (Summary of List B diseases in cattle of international trade significance).

Animal health maintenance – general principles, significance of optimum animal health in optimum production in national and international livestock trade perspectives. General production medicine - general principles, mathematical techniques used in production medicine, record systems and herd monitoring, culling and improvement. Special production medicine - herd health management programs, environmental, disease and dietary management of food animals : dairy cattle, calves and replacement heifers, meat cattle, goat, sheep and swine herds.

Department of Medicine

COURSE NO. VM 322

Course Title: Epidemiology and Preventive Medicine

Credit hour : 1

Epidemiology

1. Epidemiologic explanatory variables : Identification and procedure of measurement in population.
2. Development of questionnaires for various epidemiologic studies, surveys, surveillance and monitoring, Pre-testing of questionnaires in population, methods of collection of data.
3. Statistical analysis of data : Demonstration of association and identification of risk factors.
4. Epidemiologic response variables and properties of diagnostic tests: Procedure computation.
5. Epidemiologic data management and presenting numerical data, Measurement of population impact and transmission of disease : Procedure of computation.
6. Diagnostic testing for identification of disease process and subclinical disease.
7. Collection and analysis of ecologic data : Demonstration of ecological risk factors of disease in environment of the population of animals and birds.

Preventive Medicine

1. Development of questionnaires collection of disease and health data from population.
2. Statistical analysis for identification of risk factors.
3. Epidemiologic methods of health and disease management: Demonstration of risk factors in population and management.
4. Demonstration of biosecurity, disease security, hygienic and sanitary measures.
5. Disease management programs in population: Vaccination and disease control programs planning, execution and evaluation.
6. Early diagnosis and treatment of disease in population.
7. Herd health programs: Planning, execution, evaluation and extension of strategies.

Books Recommended (VM 321 & 322)

1. Andrews, A.S. (2002). *The Health of Dairy Cattle*. Blackwell Science Ltd. Oxford, U.K.
2. Andrews. A.H., Blowey, R.W., Boyd, H. and Eddy, R.G. (2004). *Bovine Medicine: Disease and Husbandry of Cattle*. 2nd edn. Blackwell Science Ltd., Oxford, U.K.
3. Chakrabarti, A. (2003). *A Textbook of Preventive Veterinary Medicine*. 3rd edn., Kalyani Publishers, New Delhi, India.
4. Kleinbaum, D.G., Kupper L.L. and Morgenstern, (1982). *Epidemiologic Research: Principles and Quantitative Methods*. Wadsworth, Belmont, California.
5. Leech, F.B. and Sellers, K.C. (1979). *Statistical Epidemiology in Veterinary Science*. McMillan Co. New York, N.Y.
6. Lilienfeld, A.M. and Lilienfeld, D.E. (1980) *Foundations of Epidemiology*. 2nd edn., Oxford University Press, Oxford, U.K.

7. Martin, S. W.; Meek, A.H. and Willeberg, P. (1994). *Veterinary Epidemiology: Principles and Methods*. Iowa State University Press, Ames, Iowa.
8. Parker, W.H. (1980). *Health and Disease in Farm Animals: An introduction to Farm Animal Medicine*. 3rd edn. Pergamon Press, Oxford.
9. Thrusfield, M. (2000). *Veterinary Epidemiology*. 2nd edn. Blackwell Science, Oxford, U.K.
Samad, M. A. (2000). *Veterinary Practitioner's Guide*, 1st pub. LEP Pub No. 7, BAU, Mymensingh

Department of Medicine

COURSE NO. VM 423

Course Title: Poultry Medicine

Credit hour : 2

A. Clinical Poultry Medicine

Importance of health and disease management in poultry production; Principles of presumptive diagnosis of disease in poultry population – holistic and clinical field data; Source of infection; Clinical signs of poultry diseases – definition, classification, meanings and interpretation for presumptive diagnosis of diseases.

Important general and special poultry diseases (**listed below**) – definition, causes, pathophysiology, pathogenesis, clinical characteristics (signalment, anamnesis, nature of onset, clinical signs, course and severity, physical findings of specimens), mass diagnosis, mass treatment and prognosis.

B. a) Preventive Poultry Medicine

Objectives and significance of preventive poultry medicine in subsistence and commercial poultry production of Bangladesh; concepts of biosecurity, disease security and flock immunity; Holistic characteristics (frequency, distribution, ecology, temporal patterns and trends, risk factors, economic impact) and management (prevention, control and eradication of important general and special diseases (**listed below**) in subsistence and commercial poultry populations of Bangladesh; handling of disease outbreaks; disinfection and vaccination in disease control.

b) Production Poultry Medicine

General poultry production medicine – General principles of flock health, mathematical techniques used in flock health management, record systems and flock monitoring, culling and improvement. Special poultry production medicine – planning and evaluation of poultry flock health management programs (environmental, disease and dietary management) for commercial layer, broiler, cockerel and quails, subsistence chickens and ducks; hatchery and hatching eggs management.

***Poultry Diseases**

General Diseases : Crop impaction, enteritis, stunted chick disease, bumble foot, round heart disease, endocarditis, nephrosis and gout, egg bound, abnormal eggs, egg peritonitis, false layer, internal layer.

Infectious diseases : Avian streptococcosis, avian staphylococcosis, avian salmonellosis, avian cholera, anatipestifer infection, Infectious coryza, avian colibacillosis, avian clostridiosis (botulism, ulcerative enteritis, necrotic enteritis, gangrenous dermatitis), tuberculosis, avian mycoplasmosis, avian chlamydiosis, avian pox, Newcastle disease, infections bronchitis, infectious laryngotracheitis, Marek's disease, lymphoid leukosis, egg drop syndrome 76, infectious bursal disease, chicken infectious anemia, avian influenza, hydropericardium-hepatitis syndrome, duck plague, duck virus hepatitis, aspergillosis, candidiasis, thrush.

Parasitic diseases : Nematode, cestode and trematode infections, avian coccidiosis, histomoniasis, trichomoniasis, leucocytozoonosis, avian malaria, hemoproteus infections, cryptosporidiosis, external parasitic infestations (flea, lice, tick, mite infestations).

Metabolic, nutritional, chemical and physical diseases : Protein, carbohydrate, fat, vitamin and mineral deficiency diseases. arsenic, calcium, copper, lead, nitrate, bicarbonate, sodium chloride, potassium permanganate, organic insecticides, chlorinated hydrocarbons and organophosphorus poisoning, mycotoxicoses, ascites and edema, heat stress, ammonia blindness, cannibalism, egg eating, smothering, cage layer fatigue, acute death syndrome in broiler.

Hatchery and egg borne diseases, diseases of public health significance.

Department of Medicine

COURSE NO. VM 424

Course Title: Poultry Medicine

Credit hour : 1

1. Demonstration of clinical signs of poultry diseases in population level.
2. Clinical specimens : Methods of collection, physical examination, preservation and dispatch of specimens to the laboratory.
3. Methods of mass diagnosis using clinical and holistic field data of disease in population.
4. Methods of administration of drugs in mass treatment, and vaccination.
5. Epidemiologic investigation of disease : Development of questionnaires for collection of data on poultry population characteristics and transmission of disease using principles and methods of descriptive and explanatory epidemiologic studies.
6. Procedure of measurement of poultry health and disease variables.
7. Statistical analysis of data, demonstration of association and identification of risk factors of poultry health and disease.
8. Methods of management of risk factors in subsistence and commercial poultry flocks.

9. Vaccination and disease control programs in subsistence and commercial poultry flocks: Planning, execution and evaluation of the programs, preparation of vaccination schedule.
10. Demonstration of materials used in preventive and control measures and methods of administration in poultry.
11. Development of questionnaires for collection of health and production data from subsistence and commercial poultry flocks.
12. Procedure of measurement of poultry health and production variables and collection of data.
13. Analysis of data to determine shortfalls and demonstration of shortfalls, Principles and procedure of eliminating shortfalls in commercial flocks.
14. Profit oriented flock health program: Planning, execution and evaluation for various commodities of poultry-layer, broiler, chicks, cockrel, etc.
15. Field trips to public and private poultry farms for practical exposure.

Books Recommended (VM 423 & 424)

1. Calnek, B.W. (1997). *Diseases of Poultry*. 10th edn., Iowa State University Press, Ames, Iowa, USA.
2. Hofer, H.L. (1997). *Practical Avian Medicine*. Veterinary Learning System, USA.
3. Jordan, F.T.W and Pattison, M. (2000). *Poultry Diseases*. 5th edn., Bailliere Tindall, London.
4. Rosskopf, W.J. and Woerpel, R. (1996). *Diseases of Cage and Aviary Birds*. Woerpel, Williams and Wilkins, USA.
5. Samad, M. A. (2005). *Poultry Science and Medicine*. 1st edn., LEP publication. BAU campus.
6. Singh, H. and Moore, E.N. (1993). *Livestock and Poultry Production*. 2nd edn. Prentice-Hall of India Private Ltd., New Delhi.
7. রহমান, আ. (১৯৮৬). মুরগী ও অন্যান্য পাখির রোগতত্ত্ব, ১ম ও ২য় খন্ড, বাংলা একাডেমী, ঢাকা।
8. সামাদ, এম.এ. (১৯৯৩). পোল্ট্রি পালন ও চিকিৎসাবিদ্যা, দেশ প্রকাশনা, নং ০৮, বাকুবি, ময়মনসিংহ।

Department of Medicine

COURSE NO. VM 511

Course Title: Forensic Medicine, Jurisprudence and Animal Welfare

Credit hour. : 2

A. Forensic Medicine, Jurisprudence

Introduction and definition of Veterinary Forensic Medicine and Jurisprudence; aims, scope, uses and branches of forensic medicine; difference between forensic medicine and jurisprudence; legal system – criminal courts and powers; vetero-legal wounds – classification and description of vetero-legal wounds, differences of different wounds, determination of age of injury, vetero-legal importance of wound healing; common frauds in the sale of livestock and its products; Common offences against animals – bestiality, maiming, mischief and mischievous killing (poisoning, slaughtering, violence, starvation, strangulation and drowning); causes of sudden death; accidental deaths – lightning stroke and electrocution; Examination of live and dead animals in criminal cases and submission of vetero-legal specimens; Vetero-legal report writing; Vetero-legal evidence – hints for giving evidence and witness; Veterinary legislations – Bangladesh Animal Disease Act 2005, Bangladesh Animal and Animal Product Quarantine Act 2005, Cattle Trespass Act 1871, The Livestock Importation Act 1898, Prevention for Cruelty to Animals Act 1890, Bioterrorism Act 2002, Poisons Act 1919, Dangerous Drugs Act 1930.. Organization of veterinary service in Bangladesh – nature and scope of veterinary services; Professional conduct, professional malpractices, liability, veterinary ethics, animal insurance.

B. Animal welfare

Introduction : Definition, objectives, concepts, indications and public perceptions. Causes of welfare problems of the following animals: Draught and farm animals, pet and entertainment animals, laboratory, wild and captive animals, pet birds and poultry. Control of animal welfare problems-Animal welfare regulations.

Books Recommended

1. Anon. (1997). European Union (1997). *Protocol on Protection and Welfare of Animals*. European Union Treaty of Amsterdam.
2. Appleby, M. C. and Hughes, B. O. (1997). *Animal Welfare*. CAB International, Wallingford, UK.
3. Dawkins, M. S. (1980). *Animal Suffering*. Chapman and Hall, London, UK.
4. Ewbank, R., Kim-Madslie, F. and Hart, C.B. (1999). *Management and Welfare of Farm Animals : The UFAW Farm Handbook*. 4th edn. Universities Federation for Animal Welfare, The Old School, BrewHouse Hill, Wheathampstead, Herts, U.K.
5. Michell, A.R. and Ewbank, R. (1998). *Ethics, Welfare, Law and Market Forces: the Veterinary Interface*, UFAW, Wheathampstead, UK.
6. Minnet, F.C. (1949). *Outline of Veterinary Science*. Govt. of Pakistan.
7. Rochlitz, I. (2005). *The Welfare of Cats*. Springer for Science, Netherlands.
8. Sainsbury, D. (1986). *Farm Animal Welfare*. Collins, London, UK.
9. Sharma, S.N. (1981). *Veterinary Jurisprudence*. 3rd edn. Oxford and IBH Publishing Co., India.
10. Waran, N. (2002). *The Welfare of Horse*. Springer for Science, Netherlands.

Department of Surgery and Obstetrics

Level 4 Semester I

COURSE NO : VSO 411

Course Title : Anaesthesiology

Credit hour : 3

Definition of common terms, general consideration for anaesthesia, classification of anaesthesia and anaesthetics, mode of action of different anaesthetics, stages of anaesthesia.

General principles of local anaesthetics, general pharmacology of inhalation and injectable anaesthetics, principles of preanaesthetic examination and preparation of animal

Principles of sedation and premedication: Indications, agents used and their doses in different species.

Muscle relaxants: Drugs used and their doses in various species.

Local and regional analgesia in various species: Topical analgesia, paravertebral block, field block, epidural, cornual, auriculopalpebral, supra-orbital, mandibular, infra-orbital, planter, peroneal, pudic nerve block, intravenous regional analgesia

General anaesthesia and anaesthetics:

Injectable agents - Chloral hydrate, barbiturates, dissociative agents, steroid and other agents.

Inhalation agents – Chloroform, diethyl ether, halothane, methoxyflurane, enflurane, isoflurane, nitrous oxide, and cyclopropane

Apparatus used for administration of anaesthetics

Anaesthesia of dog, cat, sheep, goat, cattle, horse

Anaesthesia of zoo and laboratory animals and birds.

Anaesthesia for obstetrical practice in various species of animals

Postanaesthetic intensive care of animals

Hazards of anaesthesia and their management.

Euthanasia: Indications, various methods and agents used.

Books Recommended

Veterinary Anaesthesia. 1991. Hall, L. W. and Clark, K.W., 9th edition, Bailliere Tindall, London.

Drugs in Anaesthetic Practice. 1984. Vickers, M.D., Schnieden, H. and Wood-Smith, F.G., Butterworths, London.

General Anaesthesia. 1989. Nunn J.F., Uttings J.E. and Brown B.R., 5th edition, Butterworths, London.

The Practice of Small Animal Anaesthesia. 1983. Sawyer, W.B. Saunders Company, London.

Manual of Small Animal Anesthesia. 1988. Paddeford, R.R., 1st edition, Churchill Livingstone, New York.

Wright's Veterinary Anaesthesia and Analgesia. 1978. Hall, L.W., ELBS and Bailliere Tindall, London.

Textbook of Veterinary Anesthesia. 1971. Soma, L.R., The Williams & Wilkins Company, Balt

Department of Surgery and Obstetrics

Level 3 Semester II

COURSE NO : VSO 321

Course Title : General Surgery

Credit hour : 3

Introduction, definition of common surgical terms and methods of therapy.

Principles of surgery:

Preoperative consideration of animals, Inflammation, suppuration and abscess formation, affection of uropygeal gland in bird, contusions, fibrosis and sclerosis, wounds, classification, characterization and treatment of wounds, healing of wounds, complications of wound healing, ulceration, necrosis, gangrene, sinus, fistula, cysts, tumors, haematoma, lymphangitis, oedema, emphysema, physical lesions, affections of joints, fractures and repair of bones, complications of fractures, yoke gall, haemorrhage and haemostasis, burns and scalds, frost bite, shock and its management, cryosurgery, paracentesis, asepsis and antisepsis.

Surgical affections of tissues:

Aetiology, classification, symptoms, diagnosis, prognosis and treatment of skin and subcutaneous connective tissues, arteries, veins, lymphatics, nerves.

Surgical affections causing lameness:

Definition, classification, aetiology, clinical signs, diagnosis, prognosis and treatment of different affections causing lameness.

Fluid therapy:

Indications, different types of fluids used, assessment of fluid deficit, administration of fluids, electrolyte and acid-base balance, transfusion of blood and blood plasma.

Department of Surgery and Obstetrics

Level 3 Semester II

COURSE NO: VSO 322

Course Title: General Surgery

Credit hour: 1

General considerations for surgery

Proficiency in operative surgery, clinical examination of the patient, surgical anatomy, preparation of patient, restraint of animals, identification and sterilization of instruments, dressing, bandaging, sutures and suture materials, different types of knots, operative technique, haemostasis, practice of fluid therapy and blood transfusion.

Passing of stomach tube, probang and catheter in domestic animals, nerve blocking, parenteral injection of drugs, sera and vaccines, diagnosis of lameness, common minor operations in domestic animals, paracentesis abdominis in bovine.

Books Recommended (VSO 321 & 322)

Dollar's Veterinary Surgery. 1980. O'Connor, J.J. 1st Indian edition, CBS Publisher and Distributors, New Delhi.
Textbook of Large Animal Surgery. 1988. Oehme, D.W., 2nd edition, Williams & Wilkins, Baltimore, USA.
Lameness in Horses. 1974. Adams, O. R., 3rd edition,
Lameness in cattle, 1972, Paul, R. Greenough, et al.
Textbook of Small Animal Surgery, Vol-I & II. 1985, Slatter, D.H., W.B. Saunders Company, Philadelphia.
Veterinary Fluid Therapy. 1985, Micheal Bynaher, Clarke and Waterman, Blackwell Scientific Publication, London.
Shoeing for Performance. 1989. Prince, H. and Fischer, R., The Crowd Press, Rambury, Malborough Wiltshine, England.
Essentials of Veterinary Surgery. 1993. Venugopalan, A., Oxford & IBH Publishing Company PVT. LTD. New delhi.
Ruminant Surgery. 1996. Tyagi, R.P.S. and Singh, J. 1st Edition, CBS Publisher & Distributors, Delhi.
Bovine Surgery and lameness. 1986. Weaver, A.D., ELBS and Blackwell Scientific Publications.
Fundamental Techniques in Veterinary Surgery. 1987. Knetch, Allan, Williams and Johnson, 3rd edition, W.B. Saunders Company, Philadelphia

Department of Surgery and Obstetrics

Level 5 Semester I

COURSE NO : VSO 517

Course Title : Operative Surgery

Credit hour : 3

Ophthalmic and aural surgery:

Surgical anatomy of the eye and ear and their examination.

Surgical affections of eye and ear: Ectropion, entropion, conjunctivitis, dacryocystitis, keratitis, corneal ulcer, staphyloma, corneal opacity, cataract, glaucoma, uveitis, dermoid cyst, parasite in the eye, otorrhea, aural hematoma.

Nasal surgery:

Epitaxis, hemoptysis, foreign bodies and parasite in the nostrils, pus in the antrum, empyema of sinus.

Dental surgery:

Parrot mouth, pig mouth, shear mouth, sharp mouth, dental tartar, dental caries, pyorrhoea, dental fistula, dentigerous cysts, extraction of teeth, dental abscess, epulis.

Gastrointestinal surgery:

Salivary mucocele, ranula, sialoliths, choking, gastro-oesophageal reflux, hematemeses, foreign body, oesophageal stricture, gastric dilation-torsion syndrome, delayed gastric emptying, traumatic reticuloperitonitis, bloat, tympany, impaction, abomasal displacement and torsion, intestinal obstruction, intussusception, volvulus, caecal dilatation, various hernias, rectal prolapse, atresia ani, atresia recti, atresia coli, rectal prolapse, intestinal anastomosis, anal sac disease, cholelithiasis, peritonitis.

Urogenital surgery:

Obstruction of urethra, urolithiasis, various types of calculi, rupture of the bladder and urethra, retention of urine, urinary fistula, castration in different animals, cryptorchidism, ectopic testis, hydrocele, scrotal abrasion, phimosis, paraphimosis, penile fracture, persistent frenulum, hypospadias, fracture of the os penis, canine venereal granuloma, hyperplasia of the prostate gland, neoplasms and other diseases, caesarean section, ovariectomy in bitch, uterine and vaginal prolapse, persistent hymen.

Udder and teat:

Affection of udder and teats: Imperforate teats, teat fissure, obstruction of the teat canal, teat fistula, papilloma, contusions, open wounds, gangrenous mastitis, abscess, tumor, ulcers, botryomycosis.

Department of Surgery and Obstetrics

Level 5 Semester I

COURSE NO : VSO 518

Course Title : Operative Surgery

Credit hour : 1

Anaesthesia and analgesia related to specific operations.

Amputation of tail, digit, declawing, aural resection in dogs, entropion and ectropion operation, enucleation of eyeball, abscess, castration, caponization, ovariohysterectomy, caesarean section, urethrotomy, cystotomy, ventriculochoerectomy (debarking), tracheotomy, oesophagotomy, gastrotomy, enterotomy, enterectomy, intestinal anastomoses, splenectomy, cholecystectomy, trephining of sinus, ligation of Stenion's ducts, opening of guttural pouch, roaring operation, penile deviation, vasectomy, , amputation of penis, Caslick's operation, trocarization, tenotomy, nephrectomy.

Books Recommended (VSO 517 & 518)

Dollar's Veterinary Surgery. 1980. O'Connor, J.J. 4th edition, CBS Publisher and Distributors, New Delhi.
Textbook of Small Animal Surgery, Vol-I & II. 1985, Slatter, D.H., W.B. Saunders Company, Philadelphia.
Veterinary Fluid Therapy. 1985, Micheal Bynaher, Clarke and Waterman, Blackwell Scientific Publication, London.
Essentials of Veterinary Surgery. 1993. Venugopalan, A., Oxford & IBH Publishing Company PVT. LTD. New delhi.
Veterinary Ophthalmology. 1991. Gelatt, K.N., 2nd edition, Lea & Febiger, Philadelphia, London.
Leonard;s Orthopedic Surgery of the Dog and Cat. 1985. Alexander JW, W.B. Saunders Company, Philadelphia, London.
Canine and Feline Nephrology and Urology. 1995. Osborne, C.A. and Finco, D.R., Williams & Wilkins, Baltimore.
Self-Assessment Colour review of Small animal Orthopaedics. 1998. Lewis, D.D., Parker, R.B. and Bloomberg, M.S., Manson Publishing Ltd.
Atlas of Canine Surgical Technique. 1984. Bedford, P.G.G.,
An Atlas of Veterinary Surgery. 1983. Hickman, J., 2nd edition, ELBS and John Wright & Sons Ltd.
Surgery of the Reproductive Tract. 1987. Cox, J.E. 3rd edition, Liverpool.

Department of Surgery and Obstetrics

Level 4 Semester II

COURSE NO : VSO 423

Course Title : Radiology and Soundness

Credit hour : 2

Radiology

Introduction, definition of common terms, properties of X-rays, quality of radiograph, X-ray machine, X-ray accessories, production of X-ray, X-ray imaging, exposure factors, contrast media for different body systems, positioning of animals, taking of radiograph, X-ray dark room,. processing of X-ray films, radiographic artifacts, interpretation of radiographs, radiation hazards and safety, scattered radiation, diagnostic radiography and fluoroscopy, principles of endoscopy and ultrasound technique, radiodiagnosis and radiotherapy in veterinary practice, scope of nuclear medicine.

Soundness:

Introduction, causes of unsoundness, unsoundness due to hereditary vices and acquired diseases, different breeds of animals and birds, conformation, colour and markings, dentition and aging, signs of health, examinations for soundness, writing of certificate, shoeing of animals.

Department of Surgery and Obstetrics

Level 4 Semester II

COURSE NO : VSO 424

Course Title : Radiology and Soundness

Credit hour : 1

Radiographic equipment and accessories, contrast media, preparation of animals and birds for taking radiographs, estimation of exposure factors, methods of taking radiographs of different organs, processing of exposed X-ray films, storage of radiograph, viewing of radiograph, use of infrared and ultraviolet rays, radiographic artifacts and interpretation of radiographs,. radiographic safety measures, management of X-ray film and dark rooms, method of examination of animals and birds for soundness and certificate writing, shoeing of animals.

Books recommended (VSO 423 & 424)

Principles of Veterinary Radiography. 1980. Douglas, S.W. and Williamson, H.D., 3rd edition, Bailliere Tindall, London.
Carlson's Veterinary Radiology. 1977. Gillette, E.L., Thrall, D.E. and Lebel, J.L., 3rd edition, Lea & Febiger, Philadelphia.
Diagnostic Radiography. 1987. Bryan, Churchill Livingstone, London.
Diagnostic Radiology of the Dog and Cat. 1987. Kealy, J.K., W.B. Saunders Company, Philadelphia, London.

Lameness in Horse. 1974. Adams, O.R., 3rd edition, Lea & Febiger, Philadelphia.
Lameness in Cattle. 1972. Greenough, P.R., MaCallum, F.J. and Weaver, D., Oliver and Boid, Edinburgh.
Self-Assessment Colour Review of Small Animal Orthopaedics. 1998. Lewis, D.D., Parker, R.B. and Bloomberg, M.S., Manson Publishing Ltd.
Bovine Surgery and lameness. 1986. Weaver, A.D., ELBS and Blackwell Scientific Publications.
Essentials of Veterinary Surgery. 1993. Venugopalan, A., Oxford & IBH Publishing Company PVT. LTD. New delhi.
Dollar's Veterinary Surgery. 1980. O'Connor, J.J., 4th edition, CBS Publishing Company, New Delhi, India.
Ruminant Surgery. 1996. Tyagi, R.P.S. and Singh, J. 1st Edition, CBS Publisher & Distributors, Delhi.

Department of Surgery and Obstetrics

Level 5 Semester I

COURSE NO : VSO 514

Course Title : Clinics (Surgery)

Credit hour : 1

Clinical diagnosis and treatment of surgical diseases and disorders in animals and birds at the veterinary clinic, ambulatory surgical services at various farms and field stations, clinical practices of surgical cases at various government and private veterinary hospitals , clinics and zoo.

Books Recommended:

Surgical Techniques in Experimental Farm Animals. 1995. F.A. Harrison Blackwell Publishing

Bovine Practice 2. 1998. M. Melling, M. Alder WB Saunders

Emergency Procedure for the Small Animal Veterinarian 2000 Signe J. Plunkett WB Saunders

Lameness in Cattle. 1972. Greenough, P.R., MaCallum, F.J. and Weaver, D., Oliver and Boid, Edinburgh.

Ruminant Surgery. 1996. Tyagi, R.P.S. and Singh, J. 1st Edition, CBS Publisher & Distributors, Delhi.

Surgery of the Reproductive Tract. 1987. Cox, J.E. 3rd edition, Liverpool

Veterinary Fluid Therapy. 1985, Micheal Bynaher, Clarke and Waterman, Blackwell Scientific Publication, London.

Fundamental Techniques in Veterinary Surgery. 1987. Knetch, Allan, Williams and Johnson, 3rd edition, W.B. Saunders Company, Philadelphia

Department of Surgery and Obstetrics

Level 4 Semester I

COURSE NO : VSO 413

Course Title : Obstetrics and Gynaecology

Credit hour : 3

Introduction and definition of common terms. Female reproduction and endocrinology. Puberty and oestrous cycle. Breeding soundness examination of female animals. Methods of oestrus detection and interventions on oestrous cycle. Fertilization and development of conceptus. Physiology of mother and foetus during pregnancy. Management of pregnant animals. Methods of pregnancy diagnosis. Abortion. Teratology. Congenital and acquired abnormalities causing reproductive inefficiencies. Initiation and mechanism of parturition, induced parturition, care and management of newborn and dam. Dystocia, its causes, incidence, diagnosis and management. Manipulative delivery in farm and companion animals. Faetotomy and caesarean operation. Injuries and diseases incidental to pregnancy and parturition. Retention of placenta. Utero-vaginal prolapse. Post partum reproduction and uterine infections. Aetiology, diagnosis, treatment, management and economic importance of infertility, subfertility and sterility. Female reproductive health management of farm, companion, wild and zoo animals. Vaccination to maximize fertility. Mastitis and udder health management.

Department of Surgery and Obstetrics

Level 4 Semester I

COURSE NO : VSO 414

Course Title : Obstetrics and Gynaecology

Credit hour : 1

Demonstration of the female reproductive organs of domestic animals on slaughterhouse materials. Phantom hall practice on palpation of bovine female genital organs and dystocia corrections. Demonstration on oestrus detection. Practice on intrauterine catheter passage, uterine biopsy, intrauterine infusion and flushing. Operative techniques of female reproductive system. Clinical and laboratory practice on pregnancy diagnosis. Demonstration on fetotomy and cesarean operation. Laparoscopy and ultrasonography of female reproductive organs.

Books Recommended (VSO 413 & 414)

Current Therapy in Large Animal Theriogenology, 1997, by R S Youngquist, W.B Saunders Company, Philadelphia

Veterinary Reproduction and Obstetrics (Theriogenology) 1998, by G. H. Arthur, D. E. Noakes and H. Pearson, 3rd edn, Bailliere Tindal, London, Sydney, Tokyo.

Veterinary Obstetrics and Genital Diseases (Theriogenology) 1986, by S. J. Roberts, 3rd edn., W. B. Saunders Company, US

Reproduction in Farm Animals, 2000. By F.S.E. Hafez, Lea and Febizer, USA.

Canine and Feline Theriogenology, 2001, by S.D. Johnston, M. V. Root Kustritz and P.N.S. Olson, W.B. Saunders Company, Philadelphia.

Fertility and Infertility in Veterinary Practice, 1988, 4th edn, by J.A. Laing, W.J. Brinley Morgan and W.C. Wagner, Bailliere Tindall.

Encyclopaedia of Reproduction 1998, by E. Knobil and J. D. Neill, Academic Press, London.

Reproductive Clinical Problems in the Dog, 1988, 2nd edn, by D. E. Jones and J. O. Joshua, Wright, London.

Manual of Small Animal Reproduction and Neonatology 1998, by G. England and M. Harvey, British Small Animal Veterinary Association, Cheltenham, UK

Veterinary Endocrinology and Reproduction, 1989, 4th edn, by L.E. McDonald and M.H. Pineda, Published by Lea and Febiger, Philadelphia, London.

Reproductive Pathology of Domestic Mammals, 1990, 1st edn. by Kenneth McEnteem, Academic Press, Inc. San Diego, Newyork.

Surgery of the Reproductive Tract in Large Animals, 1982. by John F. Cox, Liverpool University Press, UK.

Department of Surgery and Obstetrics

Level 4 Semester II

COURSE NO : VSO 425

Course Title : Andrology and Artificial Insemination

Credit hour : 2

Scope of Andrology and Artificial Insemination (AI) in Veterinary Medicine. Functional anatomy and physiology of male reproduction. Spermatogenesis, semen formation and related abnormalities. Clinical examination of males for breeding soundness evaluation. Semen collection, evaluation, processing, preservation and clinical practice of AI. Clinical management of fertility. Infertility and uterine infections due to faulty AI. Veterinary management of semen borne and AI-related diseases. Recording and clinical analysis of reproductive and AI parameters. Diseases of male reproduction. Health management of AI stud males. Reproductive biotechnology. Computer application and hormone assays for the veterinary control of AI field services.

Department of Surgery and Obstetrics

Level 4 Semester II

COURSE NO: VSO 426

Course Title: Andrology and Artificial Insemination

Credit hour: 1

Clinical examination of stud males. Collection, evaluation, processing and freezing of semen. Practice of artificial insemination. Clinical practice of the evaluation of bull station and semen laboratory to certify semen to be used at AI. Pathomorphological examination of fresh and preserved semen. Collection of seminal fluid for microbiological examination. Preparation of teaser bulls. Operative techniques for the corrections of injuries and affections of male reproductive system.

Books Recommended (VSO 425 & 426)

Current Therapy in Large Animal Theriogenology, 1997, by R S Youngquist, W.B Saunders Company, Philadelphia

Marshall's Physiology of Reproduction, 1990, 4th edn., edited by G. E. Lamming, Vol 2, (Reproduction in the Male), Churchill Livingstone, London, Melbourne and Yew York

Veterinary Reproduction and Obstetrics (Theriogenology) 1998, by G. H. Arthur, D. E. Noakes and H. Pearson, 3rd edn, Bailliere Tindal, London, Sydney, Tokyo.

Veterinary Obstetrics and Genital Diseases (Theriogenology) 1986, by S. J. Roberts, 3rd edn., W. B. Saunders Company, US

Physiology of Reproduction and Artificial Insemination in Cattle, 1978, 2nd edn, by G. B. Salisbury, N. I. Vandemark and J. R. Lidge, Freeman and Company, Sanfransisco, USA.

Reproduction in Farm Animals, 2000. By F.S.E. Hafez, Lea and Febizer, USA.
Reproduction in Domestic Animals, 1991, 4th edn., By P. T. Cupps, Academic Press, Inc. California, London.
Reproductive Clinical Problems in the Dog, 1988, 2nd edn, D. E. Jones and J. O. Joshua, Wright, London.
Reproductive Pathology of Domestic Mammals, 1990, 1st edn. by Kenneth McEnteem, Academic Press, Inc. San Diego, Newyork.

Department of Surgery and Obstetrics

Level 5 Semester I

COURSE NO : VSO 512

Course Title : Clinics (Theriogenology)

Credit hour : 1

Diagnosis and treatment of genital diseases of male and female animals at the clinics. Treatment of gynaeco-obstetrical and infertility related cases at the clinics and field conditions. On farm practice of reproductive health management, mastitis diagnosis, treatment and udder health management.

Books recommended

Veterinary Reproduction and Obstetrics (Theriogenology) 1998, by G. H. Arthur, D. E. Noakes and H. Pearson, 3rd edn, Bailliere Tindal, London, Sydney, Tokyo.
Veterinary Obstetrics and Genital Diseases (Theriogenology) 1986, by S. J. Roberts, 3rd edn., W. B. Saunders Company, US
Current Therapy in Large Animal Theriogenology, 1997, by R S Youngquist, W.B Saunders Company, Philadelphia
Canine and Feline Theriogenology, 2001, by S.D. Johnston, M. V. Root Kustritz and P.N.S. Olson, W.B. Saunders Company, Philadelphia.
Equine Reproduction, 1993 by Angus-o-McKiron, James, L Boss, Lea and Febiger, London.
Reproductive Clinical Problems in the Dog, 1988, 2nd edn, D. E. Jones and J. O. Joshua, Wright, London.

Department of Animal Breeding & Genetics

Level -3, Semester- II

COURSE NO. : ABG 329

Course Title: Genetics and Animal Breeding

Credit hour : 3

Genetics :

Introduction : Definition, branches of genetics, application of genetics in livestock and poultry, early development and modern concept of genetics.

Mendelian Genetics : Principles of inheritance-the law of segregation and the law of independent assortment, modification of Mendelian ratios, lack of dominance, lethal genes, epistasis, linkage and crossing over.

Sex determination and sex linkage : Mechanism of sex determination; free-martin, intersexes and super sexes, sex-linked, sex-influenced and sex limited characters.

Gene expression : Functions of gene, genetic control of metabolism, protein synthesis.

Mutation : The molecular basis of mutation, Phenotypic effects of mutation, practical application of mutation in the field of livestock.

Chromosomal aberration : Deletion, duplication

Variation in chromosome number : Aneuploidy and polyploidy in animals, chromosomal abnormality syndromes in animals.

Hereditary defects and genetic resistance to diseases.

Multiple gene effects : Quantitative traits, mechanism of inheritance of quantitative traits.

Animal Breeding:

Variation in quantitative traits : Phenotypic, genetic and environmental variations, concept of heritability and repeatability.

Principles of selection : Mass selection, pedigree selection, family selection, progeny testing.

System of mating : Inbreeding, linebreeding, outbreeding, crossbreeding, grading and species hybridization.

Department of Animal Breeding & Genetics

Level -3, Semester- II

COURSE NO. : ABG 330

Course Title: Genetics and Animal Breeding

Credit hour : 1

Exercises on segregation, gamete formation, gene combination, Mendelian ratios in the formation of genotypes, probability, Chi-square test, estimation of repeatability and heritability.

Books Recommended (ABG 329 & 330)

Genetics of Livestock, improvement, Lasley, J.F. 1987. (3rd edition), Prentice Hall, Engle Wood Cliffs, New Jersey.

Veterinary Genetics, Nicholas F.W. 1987. Claridon Press, Oxford.

The Principles of Heredity, Snyder, L.H. and P.R. David, 1957. (5th edition) D.C. Health and Co., Sexington Massachusetts.

Breeding and improvement of Farm Animal (7th edition). Warwick, E.J. and J.E. Legtes. McGraw Hill Book Co. Inc., Newyork. 1987.

Introduction to Practical Animal Breeding. Malcolm B. Willis. Dalton's Third Edition. Blackwell Sc. London. 1991.

Department of Animal Nutrition

Level -2 , Semester II

COURSE NO. :AN 223

Course Title : Animal Nutrition

Credit hour : 3

Definition & scope of nutrition, its relation with other decipline of Science, history of it development. Classification of food nutrients and their functions.

Metabolic functions & deficiency of minerals & Vitamins.

Digestion & utilization of carbohydrate, Protein, & fat in monogastric and polygastric animals
Feeding standards.

Feed stuffs & their classification. Balancing ration for different species of animals.

Digestibility and nutrient value of different feed.

Nutrients and feed requirement in animals at various stages of growth reproduction and production.

Feeding animals and factors affecting food

Department of Animal Nutrition

Level -2 , Semester II

COURSE NO. :AN 224

Course Title : Animal Nutrition

Credit hour : 1

Processing & preparation of feed samples for nutritional analysis.

Proximate analysis of feed stuffs.

Identification of common feed stuffs.

Feed formulation for different ages/stages of animals.

Books Recommended (AN 223 & 224)

Feeds & Feeding, Morrison F.B. (1956), The Morrison Publish Co. Itheca, New York

Animal Nutrition, Banerjee G.C. (1978). Oxford & IBH Publishing Co. New Delhi, India.

Animal Nutrition , Mayhard L.A., Losli L.K., Hintz H.F. and Warner R.G. (1984) (7th edition)Tata Mc graw Hill Publishing Company Ltd., New Delhi, India.

Dairy cattle feeding and Nutrition. Miller W.J. (1979). Academic press. New york, USA.

Animal Nutrition and Feeding practices in India. Ranjan S.K. (1977). Vikash publishing House. Pvt. Ltd. India.

Department of Animal Science

Level -1, Semester- 1

COURSE NO. : AS 115

Course Title : Animal Science

Credit hour : 3

Introduction : Introduction and scope of animal husbandry and animal science. Population of livestock in Bangladesh. Introduction to domesticated animal ecology, psychology, behavior and their vices. Importance of livestock and their impact on the economy of Bangladesh Adaptation of exotic Animals in Socio-economic and climatic conditions of Bangladesh

Scientific and professional terms : Horse, Cattle, buffalo, Sheep and goat.

Common breeds of livestock: Common breeds of livestock, their important characteristics and adaptive ability with special emphasis on horse, cattle, buffalo, sheep and goat.

Housing : Economic importance of housing. Objectives and Principles of housing for livestock Selection of site for livestock farm Types and system of housing for livestock

Management of livestock : Different management practices of livestock. Care and management of farm animals. Disposal of animal wastes from different farms.

Products and by products: Elementary knowledge on slaughter house by products. Composition and food value of meat and factors affecting quality and quantity of quantity of meat.

Department of Animal Science

Level 1, Semester 1

COURSE NO. : AS 116

Course Title : Animal Science

Credit hour : 1

Handling and approaching of Animals

Identification of different body parts of livestock

Identification and important characters of different breeds of cattle, buffaloes, sheep and goat.

Restraining tools of livestock.

Casting of livestock

Shoeing tools and shoeing of livestock

Dentition and Ageing of livestock.

Methods of grooming, washing, bedding, clothing, marking and castration.

Recommended Books (AS 113 & 114)

A Text Book of Animal Husbandry, by Banerjee, G.C. 1999, Eight Edition, Oxford and IBH Publishing Co. New Delhi 11001. India.

An Introduction to Animal Husbandry in the Tropics, by Williamson G, and Payne, W.J.A. 1978, Third Edition, Longman Group Ltd. England.

Animal Science, by Ensminger, M.E. 1969, Sixth Edition. The Interstate Printers & Publishers, Inc. Danville, Tillinois, USA.

Livestock Husbandry Techniques, by McNitt, J.I. 1983, Granada Publishing Ltd., London.

Practical Animals Husbandry (Seventh edition), by Miller, W.C. & E.D.S. Robertson 1959, Oliver & Boyd. Edinburgh, U.K.

Management and Feeding of Buffaloes, by Ranjhan, S.K. and N.N. Pathak 1979, Vikas Publishing House Pvt. Ltd., New Delhi, India.

Animal behaviour, by Ridley, M. 1986, Blackwell Scientific Pub. London. U.K.

Modern breeds of livestock, by Briggs H.M. & Briggs D.M. 1984, McMillan Pub., New York, U.S.A.

The behaviour of domestic animals, by Hafez, E.S.E. 1975, 3rd edn. Bailliere Tindall, London, U.K.

The Study of Animal behaviour, by Huntingford. F. 1984, Chapman & Hall, London, U.K.

Department of Animal Science

Level-3, Semester-1

COURSE NO. AS 313

Course Title : Animal Waste Management

Credit hour : 2

Introduction and glossary of waste management in livestock farms.

Importance and objectives of waste management.

Measures for handling farm wastes.

Methods for processing and treatment of animal wastes.

Effects of Animal wastes on public health and environment.

Disposal of animal wastes.

Safety and regulation of animal wastes.

Department of Animal Science

Level-3, Semester-1

COURSE NO. AS 314

Course Title : Animal Waste Management

Credit hour : 1

Identification of farm animal wastes.

Handling of wastes in animal farm

Storage and treatments of animal waste

Disposal of animal wastes.

Books Recommended (313 & 314)

1. Manure disposal from livestock farms. David Sainsbury and peter Sainbury, In : Livestock Health and Housing ELBS.

London. 1982.

2. Farm Wastes Hanbook. Aberdeen. A.M. Robertson; Scottish Farm Buildings Investigation Unit. 1977.

3. Animal Waste Management and Wastewater treatment. E.P. Taniganides, In: World Animals Science, v-6. Animal

Agriculture and Environmental Health (Ed.E.E.Stranch). Elsevier Science Publishing Company Inc. 1987.

4. Animal production and pollution problems. In : Livestock Production for 21st Century : P.E.V. Williams, and J.M. Kelly
Priorities and Research Need (Ed. P.A. Thacker). 1994.

Department of Dairy Science

Level- 2, Semester-I

COURSE NO.: DS 213

Course Title: Elementary Dairy Science

Credit hour: 3

Introduction of Dairy Science Department.

Definition of Dairy Science.

Statistics related to dairying of Bangladesh and leading dairy countries.

Terminology of dairy cattle.

History of dairying.

Taxonomy-origin and classification of dairy animals.

Characteristics of important dairy breeds – local and foreign.

Importance of dairy farming.

Milk production and its utilization in different leading countries.

Feeding and management problem of Dairy animals.

Use of bedding and disposal of farmyard manure.

Principles of dairy farm management with special reference to veterinary activities.

Cleaning, sanitation and sterilization of farm equipment.

Preliminary knowledge about milking.

Keeping health-records for dairy herd.

Introduction, definition and composition of milk.

Food value of milk.

Sources of contamination of milk and their control.

Department of Dairy Science

Level- 2, Semester-I

COURSE NO.: DS 214

Course Title: Elementary Dairy Science

Credit hour: 1

General information about the Bangladesh Agricultural University dairy farm and an ideal dairy farm.
Name of common house at the Bangladesh Agricultural University dairy farm and an ideal dairy farm.
Identification of different dairy breeds of cow and buffalo.

Handling of Dairy Cows, Calves, Heifers, Bulls and Buffaloes.

Identification and uses of dairy utensils and equipment.

Identification of Dairy Animals(tagging, tattooing, branding, marking).

Dentition and ageing.

Health records of dairy cattle as the source of diagnosis of diseases and treatment.

Cleaning and washing of dairy animals and dairy utensils and equipments.

Books Recommended (DS 213 & 214)

1. Dairy Science, W.E. Peterson, Second Edn. J.B. Lippincott Co. New York. 1958
2. Dairy Cattle and Milk Production, C.H. Eccles, the Macmillan Co. New York, 1960.
3. Elements of Dairying, T.M. Olson, the Macmillan Co. New York, 1965.
4. Milk production and Processing, Judking and Keener, Jhon Willey & Sons, New, York, 1960.
5. A Text Book of Animal Husbandry, G.C. Banerjee, Oxford & IBH Pub. New Delhi, 1987.
6. Understanding the Dairy Cow, Jhon Webster, 1st Edn. British Library, Cataloging in Publication Data, ISBN, 0-612-01889-5.
7. Animal Husbandry and Dairy Science, Jagadish Prasad, Kalyni Publishers, New Delhi, Ludiana, Kolkata, 1997.
8. Brochure of Animal Husbandry-Published by Dean of Animal Husbandry.

Department of Poultry Science

Level 1, Semester II

COURSE NO. : PS 123

Course Title : Elementary Poultry Science

Credit hour : 3

Population of Poultry in Bangladesh. Role of Poultry in economy of Bangladesh. History and Development of Poultry. Origin and Domestication of Poultry Species. Consequence of domestication of Poultry. Habitats of different poultry species.

Importance of Poultry and Poultry products. Terminology used in Poultry Science. Classes, Breeds and Varieties of Poultry, broiler and hybrid layers. Major chicken breeds and their characteristics. Chronological development classes, breeds and varieties.

Different body system; Digestive system, Skeletal system, Reproductive system and Respiratory system and their relations with meat and egg production.

Structure and formation of eggs. Abnormality in eggs. Vices in Poultry.

Space requirements for different species. Incubation periods of different species. Principles and practices of incubation. Selection of eggs for hatching. Different types of Poultry farms. Different types of houses for poultry. Site selection for poultry farm. Brooding of chicks
Principles and methods of poultry feeding. Sexing, debeaking and selection of breeding stock; culling. Lighting and other management practices in poultry farming.

Department of Poultry Science

Level 1, Semester II

COURSE NO. :PS 124

Course Title : Elementary Poultry Science

Credit hour : 1

Holding and handling of poultry.

Identification of different body external parts of poultry.

Demonstration of internal body parts of poultry.

Identification of different poultry species.

Identification of breeds and varieties.

Identification of eggs of different poultry species, hatching, brooding, sexing, debeaking

Culling and selection of breeding stocks.

Identification of different equipments and appliances.

Identification & poultry feed staff, methods of feeding, feeding schedule.
Demonstration on poultry housing.
Demonstration on different floor systems.

Books Recommended (PS 123 & 124)

Poultry Sci. & Practices 5th Edn. Winter, AR & Funk, E.M. (1960). J.B. Lippincott Co. U.S.A.
Poultry Breeding and Genetics, R.D. Crawford, (1990). Elsever Publishers. Amsterdam, The Netherlands.
Nutrient Requirements of Poultry. 9th revised edition. National Research council washington, D.C. U.S.A. 1994.
Hatchery Operation and Management. E.M. Funk and N.R. Irwin(1995).
New york, gohn wiley and Sout, Iuc, London-Chapman and Hall Ltd.

Department of Farm Structure

Level-4, Semester-1

COURSE NO. FS 413

Course Title : Livestock Farm Design and Environment

Credit hour : 3

Farmstead planning considerations, site selections, farm classification, space requirements and basic design criteria.
Construction materials : Brick, sand, cement, timber and steel; material and cost estimation of brick, concrete, timber and steel works.

Livestock housing : Farm components, floor components in relation to animal comfort and disease, herd size calculation, layout design of barn, hospital, maternity area and milking center, confined and loose houses design, housing for calves and heifers. Layout and design of poultry houses.

Abattoirs : Specifications, design requirements and layout, environment and hygienic factors.

Environmental factors : Climatic conditions for livestock, heat, vapor and air exchange in livestock sheds, air flow patterns, air-moisture-temperature relationship and its impacts.

Environmental controls : Purposes of ventilation, natural and artificial ventilations, air pressure and velocity, relative humidity, quantify number and sizes of fans, air inlet area, evaporative cooling system, heat and moisture balance, ventilation for cold and rainy days.

Water supply : Water storage, supply and drainage for livestock farms.

Lighting : Fundamentals of lighting, natural and artificial lighting.

Department of Farm Structure

Level-4, Semester-1

COURSE NO. FS 414

Course Title : Livestock Farm Design and Environment

Credit hour : 1

a) Lab exercise :

- i) Planning and layout design of a typical farmstead
- ii) Design of commercial livestock farms

b) Visit to abattoirs and livestock farms

Books Recommended (FS 413 & 414)

1. Agricultur Buildings and Structures-James H. Whitaker, Reston publishing company, Virginia. 1979.
2. Functional Design handbook for Australian Farm Buildings-G.J. Redding
3. Farm Structures-H.J. Barre and L.L. Sammet
John Wiley & Sons, Inc., N.Y., USA. 5th Printing March 1963.
4. Planning and Design of Farm Buildings with reference to Bangladesh conditions-M.W. Ullah
A Thesis submitted to the Institute of Agric. Engg., RVAU, Denmark. 1981.

Department of Farm Power and Machinery

Level-4, Semester-1

COURSE NO.: FPM 4101

Course Title: Farm Operation and Management

Credit hour : 3

1. Management : Concepts and theories of management, organization and administration, Introduction to Farming Systems
2. Leadership : Types of leadership, leadership characteristic, Function of a Manager.
3. Linear Programming : Introduction, model formulation and solution, application to livestock farm management.
4. Networking : Shortest route and PERT problem, application to livestock and disease control management.
5. Management of Clinic and Farm: Location and layout of Clinic & Farm.
6. Inventory model: Introduction, formulation of model and solution, application to medicine and feed inventory system.
7. Transportation and distribution model : Application to medicine, feed and livestock products.
8. Queueing theory : Introduction, characteristic, application to clinical service design and management.
9. Purchasing function and interfaces with supplier: quotation, tender, public procurement rule.
10. Operation and maintenance of farm equipment, with special reference to hygienic interventions and safety measures.

Department of Farm Power and Machinery

Level-4, Semester-1

COURSE NO.: FPM 4102

Course Title: Farm Operation and Management

Credit hour : 1

- 1) Lab exercises: linear programming, inventory model, transportation model with application to dairy, poultry and zoo management.
- 2) Project proposal preparation, project logical frame work, activity bar-chart & budget
- 3) Field visits

Books Recommended (FPM 4101 & 4102)

1. Introduction to Operations Research (7th ed.), 2001 - F.S. Hillier & G.J. Lieberman, Mac Graw Hill Publishing
2. Fundamental of Management Science 1981. Turban, E. Meredith, J.R. McGraw-Hill Co.
3. Engineering Economy (6th ed.), 1979 - E.P. DeGarmo, J.R. Canada & W.G. Sullivan, Macmillan Publishing Co.
4. Organization and Management - B.S. Blanchard, Prentice-Hall, New Delhi
5. Operations Research - H.A. Taha, Collier Macmillian, New York

Department of Agricultural Economics

Level- 5 Semester- 1

COURSE NO. AE 511

Course Title: Livestock Production Economics;

Credit hour: 3

1. Economic Concepts of Livestock Production

Definition and concepts of Economics and Livestock Economics, Scope of Economics, Economic principles applicable to Livestock production

2. Theory of Demand and Supply

Meaning and types of demand, Law of demand, Factors influencing demand, Demand function, Demand schedule, Demand curves, Changes in demand, Elasticity of demand.

Indifference curve analysis, Marginal rate of substitution, Properties of indifference curves, Consumer's equilibrium.

Meaning of supply, Factors influencing supply, Supply function, Supply curves, Supply elasticity.

3. Livestock Production

Theory of production, Factors of production, Production function, Stages of production, Laws of returns, Cost and return of livestock production.

4. Marketing of Livestock Products

Meaning of market, Classification of market, Characteristics of market, Price determination of livestock products under perfect competition, Marketing channel, Marketing margin and efficiency, Marketing functions: Standardization and grading of livestock products.

5. Project Analysis in Livestock Production

Meaning of project, Undiscounted and discounted measures of project worth: BCR, NPV and IRR.

Department of Agricultural Economics

Level-5 Semester-1

COURSE NO. AE 512

Course Title: Livestock Production Economics;

Credit hour: 1

1. Cost and return analysis
2. Analysis of marketing cost and margin
3. Application of project appraisal technique in livestock production

Books Recommended (AE 511 & 512)

1. Ahuja, H.L. (2006): Modern Microeconomics, 12th edition, S. Chand & Co. Ltd. New Delhi.
2. Dewett, K.K. (2005): Modern Economic Theory, 22nd edition, Shyam Lal Charitable Trust, New Delhi.
3. Gittinger, J.P. (1996): Economic Analysis of Agricultural Projects, Second edition, The John Hopkins University Press, Baltimore and London.
4. Kohls, R.L. and Uhl, J.N. (2005): Marketing of Agricultural Products, 9th edition, Prentice Hall, New Delhi.
5. Samuelson, P.A. (2005): Economics, 18th edition, McGraw Hill, New York.
6. Tomek, W.G. and Robinson, K.L. (1977): Agricultural Product Prices, Cornell University Press, Ithaca.
7. Owen, E., Kitalyi, A., Jayasuriya, N. and Smith, T. (ed.) (2005): Livestock and Wealth Creation: Improving the husbandry of animals kept by resource-poor people in developing countries. Nottingham University Press, Nottingham.
8. Gittinger, J.P. (1996): Economic Analysis of Agricultural Projects, Second edition, The John Hopkins University Press, Baltimore and London.

Department of Languages

Level 1, Semester 1

COURSE NO. LAN 111

Course Title: English Language

Credit hour: 2

Textual study and comprehension of a few selective BBC talks

Socio-linguistic rules to perform language function in English.

Basic grammatical structures

Types and constructional forms of sentences; Sequence of tense; Voice; Verbs, Verb patterns and verb modifiers; Syntax including transformation and combination of sentence and framing of WH-questions.

Nouns, determiners and adjectives; Adverbials; Prepositional phrases; Headword, Infinitive phrases; Participle phrases; Appositives.

Mechanics- Punctuation, Quotation marks, Capitalization, Numbers, Abbreviation, Italics, Spelling (including most common mistakes).

Principles and methods of composition : Precise, Abstract or Summary, Paragraphs, Letters, Short Essays and Reports.

Books Recommended

The English We Use by Close, R.A. 1988. 24th Indian Edition, Longman, Calcutta.

A Communicative Grammar in English by Leech, G. and Svartvik, J. 1995. 2nd Edition. Longman, London and NY.

Guide to Patterns and Usage in English by Hornby, A.S. 1998. 2nd Edition., Oxford University Press, Delhi.

High School English Grammar and Composition. By Wren and Martin.1980. S. Chand & Company, India.

Cliffs TOEFL Preparation Guide by Pyle, K.A. and Munoz, M.A. 1992. 62 Revised Edition BPB Publications.

Advanced Learner's Degree General English, by Chowdhury, M.Y.A. and Hossain, M.M. 2002, Advanced Publications, Banglabazar, Dhaka.

The Magic Way to English Language, by Rabbani, M.G.2000. Kazal Brothers Ltd., Banglabazar, Dhaka

Writing Skills Handbook, Wiener, B.1988, 4th Ed. Houghton Mifflin Company, Boston and New York, USA.

Oxford Advanced Learner's Dictionary of Current English by Hornby, A.S. 1996. Ed. J. Crowler, 5th Edition, Oxford University Press, London.

A Text Book of Modern Functional English, by Begum, J. 1988. Globe Library Pvt. Ltd. Dhaka.

English Pronouncing Dictionary, by Jones, D. 1977. University of Cambridge, U.K.

Department of Agricultural Statistics

Level -2 , Semester -II

COURSE NO. :STAT 215

Course Title : Biostatistics

Credit hour : 2

Definition, scope and limitations of Statistics. Different types of variables. Frequency distribution: construction and graphical representation. Measures of location and variation and shape characteristics of curves.

Random experiment, outcome, sample space, events, mutually exclusive, equally likely, independent and dependent events.

Mathematical and statistical definitions of probability, compound and conditional probability. Additive and multiplicative laws of probability. Random variable, probability distribution. Probability function. Binomial, Poisson and Normal distributions.

Simple correlation and regression : Scatter diagram, Pearson's correlation coefficient with its properties, least squares method for fitting regression line. Properties of regression coefficients.

Population and sample. Hypothesis, null and alternative hypotheses, type I error, type II error, level of significance. Basic steps for testing hypothesis. Statistical tests: a population mean is equal to a specified value, equality of two population means (independent & correlated), significance of correlation and regression coefficients, independence of attributes. Experimental design : Basic concepts and principles. Completely randomized and randomized block designs. Basic study design : cohort study, cross-sectional study and case control study. Measures of disease frequency : rates (prevalence and incidence), ratios (odds ratio and risk ratio).

Department of Agricultural Statistics

Level -2 , Semester -II

COURSE NO. :STAT 216

Course Title : Biostatistics

Credit hour : 1

Frequency tables and their graphical representation. Measures of location and variation. Moments. Measures of skewness and kurtosis. Pearson's correlation coefficient. Fitting linear regression to observed data by the method of least squares.

Statistical tests : A population mean is equal to a specified value, equality of two population means (for both independent & correlated samples), a population proportion is equal to a specified value, equality of two population means (for both independent & correlated samples), a population proportion is equal to a specified value, equality of two population proportions, independence of attributes, significance of correlation and regression coefficients.

Analysis of variance for completely randomized and randomized block designs.

Recommended Books (STAT 215 & 216)

Fundamentals of Mathematical Statistics, Gupta, S.C. & V.K. Kappor (1983). S. Chand and Chand Company Ltd., New Delhi.

Epidemiologic Research : Principles and Quantitative Methods, Kleinbaum, D.G, L.L. Kupper and H. Morgenstern (1982), Van Nostrand Reinhold, New York.

Statistics Methods in Agriculture and Experimental Biology. Meed R. and Currow R.N. (1983), Chapman and Hall, Lond

An Introduction to the Theory of Statistics, Shil, R.N. and S.C. Debnath (1992), Minati Shil and Amita Debnath, Mymensingh.

Principles and procedures of Statistics, Steel, R.G.D and J.H. Torrie (1960), McGraw-Hill Book Co. Inc. New York.

Veterinary Epidemiology, Thrusfield, M. (1986), Butterworth & Co. Ltd., London.

Statistical Quality Control, Douglas C. Montgomery (2001), John Wiley & Sons, New York.

Statistical Quality Control, Douglas C. Montgomery (1987), John Wiley & Sons, New York.

Department of Agricultural Extension Education

Level -4 , Semester-II

COURSE NO. :AGEXT 423

Course Title : Agricultural Extension Education

Credit hour : 3

Agricultural Extension : Concept, meaning and principles of Agricultural Extension; Importance of veterinary extension and livestock situation in Bangladesh.

Extension Organization and Leadership : Meaning and features of an extension organization. Meaning types and forms of leadership. Qualifications of a good leader, role of professional and local leaders.

Motivation and learning : Concept and meaning of motivation. Maslow's need theory. Learning process and laws of learning with their implications.

Communication in Extension : Meaning and importance of communication process. Key elements in the communication process. Factors affective communication in extension work for livestock development.

Extension Teaching Methods : Classification of extension teaching methods, Essential elements, requirements and preparing/conducting of important extension teaching methods, advantages and limitations of using different extension teaching methods with reference to Bangladesh condition.

Diffusion and Adoption of Innovation : Innovation and its types ; elements in the diffusion process; paradigm of innovation decision process; innovativeness and adopter categories.

Programme Planning and Evaluation in Extension : Concept, importance, principles and steps of extension programme planning for livestock development. Meaning, purpose, principles and steps of monitoring and evaluation of projects related to veterinary extension work.

Department of Agricultural Extension Education

Level -4 , Semester-II

COURSE NO. :AGEXT 424

Course Title : Agricultural Extension Education

Credit hour : 1

An orientation to different organizations related to agricultural and livestock development.

Preparation of interview schedule for collection of data about rural and livestock situation.

Preparation of teaching aids: poster, flashcards and leaflets.

Group discussion techniques : lecture, Role playing and Philip 66.

Extension Field trip to rural areas/Upazila Headquarters to observe rural development activities in the field situation with special emphasis on livestock.

Books Recommended (AGEXT 423 & 424)

Leadership and Dynamic Group Action. Beal, G.M., J.M. Bholen and J.N. Roudabaugh 1972.
Ames : The Iowa State University Press.

Krishi Samprasaran Parichiti, Bhuiya, M.H. 1988., Dhaka: Jamuna Printers

Samprasaran Monobigan. Bhuiya, M.H. and M.A.M. Miah. 1998. Dhaka : Dhaka, Krishi
Lekhak Forum.

Extension Organization Management. Bhuiyan, M.H. 1999. Dhaka, Gulshan Publications
Education and Communication for Development. 2nd edn. Dahama, O.P. and O.P. Bhatnagar
1980. New Delhi, Oxford and IBH Publishing Co. Pvt. Ltd.

Samprasaran Bijnan (Extension Science). Kashem, M.A. 1992. Dhaka, The Bangladesh Packing
Press.

Cooperative Extension Work. 3rd edn. Kelsey, L.D, C.C. Hearne 1963. New York, Comstock
Publishing.

Extension Communication and Management. 4th edn. Ray, G.L., 1996. Kolkata, Naya Prokash.

Rogers. E.M. 1995. Diffusion of Innovations. New York, The Free Press

Agricultural Extension. 2nd edn. Van den Ban, A.W. and H.S. Hawkins 1996. London Blackwell Science Ltd.

Department of Biochemistry

Level -1, Semester -1

COURSE NO. : BCHEM 111

Course title : Biophysics and Chemistry of Biomolecules

Credit hour : 3

Solutions and methods of expressing concentration. Law of mass action. Water, acids, bases and electrolytes pH and buffers.

Surface tension. Viscosity. Adsorption. Colloidal state and membrane phenomenon. Diffusion and Osmosis.

Spectrophotometry, Electrophoresis, Isoelectric focussing chromatography.

Carbohydrates: Occurrence, classification, biological importance of carbohydrates and their derivatives. Cell wall polysaccharides.

Proteins: Classification and physicochemical properties. Classification of amino acids. Naturally occurring peptides. Determination of amino terminal and carboxy terminal amino acids. Concept of protein structures. Denaturation.

Lipids: Classification, biological importance and functions. Chemistry of fatty acids, fats, phospholipids, sphingolipids, glycolipids, lipoproteins and sterols. Lipids as membrane constituents. Characterization of fat.

Nucleic acids: Occurrence, classification, composition, structural features and physicochemical properties.

Hormones: Chemical nature, classification and biochemical functions.

Books Recommended:

Biochemistry, by Albert L. Lehninger, 1982. 2nd Edition. Kalyani Publishers. Ludhiana, New
Delhi.

Biochemistry, by Lubert Stryer, 1986Published by S.K. Jain for CBS Publishers and
Distributors, 485 Jain Bhawan, Bola Nath Nagar, Delhi, India.

Harper's Review of Biochemistry by David W. Martin, Jr. Peter A. Mayes, Victor W. Rodwell
and Davy K. 1983. Granner. 20th Edition, 1983. Lange Medical Publication. Drawer L.
Los, Altos, California, USA.

Outlines of Biochemistry, by Eric E. Conn, Paul K. Stumpf, George Brueming and Roy, H. Doi.
1987. John Wiley and Sons, New York.

Text Book of Biochemistry, by Edward S. West, Wilber R. Todd, Haward S. Mason and John
T. Van Bruggan 1966. 4th Edition. The Macmillan Company. Collier-Macmillan
Ltd. London.

Department of Biochemistry

Level -1, Semester -1

COURSE NO. : BCHEM 112

Course title : Biophysics and Chemistry of Biomolecules

Credit hour : 1

Preparation of solutions. Determination of pKa value. Preparation of buffer solutions and determination of pH. Activity of salivary amylase. Colour tests of carbohydrates and proteins. Separation and identification of sugars and amino acids by TLC. Determination of reducing sugars. Detection of sugars and proteins in blood and urine. Solubility tests for fats. Estimation of vitamin C and thiamine.

Books Recommended:

An introduction to practical Biochemistry, by Davit T. Plummer. 1995. Tata McGraw-Hill Publishing Company Limited, New Delhi.
Biochemistry Laboratory Manual by F. M. Strong 1965. W.M.C. Brown Company Publishers, USA.
Biochemistry Laboratory Techniques, by Sterling Chaykin 1970. Wiley Eastern Private Limited, New Delhi.
Biochemical Calculations. How to Solve Mathematical Problem in General Biochemistry, by Irwin H. Segel 1968. John Wiley and Sons, Inc. New York.
Experimental Biochemistry. A Laboratory Manual, by Gerald Litwack 1960. John Liley and Sons. Inc, New York.
Association of Official Analytical Chemists (AOAC), Official Methods of Analysis. By Washington D.C., 1990.
Practical Clinical Biochemistry. Vol. 1, Varley, H; Gowelock, A.H. and Bell, M. 1980.

William Heinemann Medical Books Ltd. London, U.K.

Department of Biochemistry

Level 1, Semester II

COURSE NO. : BCHEM 123

Course Title : Metabolism of Biomolecules.

Credit hour : 3

Free energy, Entropy and enthalpy. Exergonic and endergonic reactions. ADP-ATP cycle.

Enzymes: Classification . Elements of kinetics. Mode of action. Coenzymes. Inhibition and prosthetic groups. Clinical importance of enzymes.

An overview of metabolism.

Stages in the breakdown of biomolecules.

Carbohydrate metabolism: Glycolysis, Krebs cycle, Entry of different substances in glycolytic pathway. Gluconeogenesis, Alcoholic fermentation. Cori cycle. Metabolic regulation of glycolysis and Krebs cycle. Shuttle systems. Electron transport chain. Oxidative and substrate level phosphorylations. Pentose phosphate pathway. Lactose biosynthesis.

Protein metabolism: Blood amino acid pool. Nitrogen balance. Catabolism of amino acids. Transamination, Deamination, decarboxylation, deamidation. Inborn error of amino acid metabolism. Detoxification of ammonia in liver and brain.

Lipid metabolism: Biological oxidation of fatty acids, Propionate catabolism in animals. Ketone body formation, utilization and physiological effects of ketosis. Biosynthesis of fatty acids.

Nucleic acid metabolism: Replication, transcription and translation. Recombinant DNA.

Vitamin and Mineral : Sources and biochemical functions.

Books Recommended:

Applied Human Nutrition, F. Ann Walker. 1990.. Ellis Horwood Limited, West Sussex, England.

Biochemistry. 2nd Edition, Albert L. Lehninger. 1982.. Kalyani Publishers. Ludhiana, New Delhi..

Biochemistry, Lubert Stryer. 1986. Published by S.K. Jain for CBS Publishers and Distributors, 485 Jain Bhawan, Bhola Nath Nagar, Delhi.

Harper's Review of Biochemistry. Granner. 20th Edition. David W. Martin, Jr. Peter A. Mayes, Victor W. Rodwell & Davy' K. 1983. Lange Medical Publication. Drawer L. Los, Altos, California, USA.
Nutrition in Health and Disease, Helen M. S. 1976.. J.B. Lippincott Company, Philadelphia.
Outlines of Biochemistry, Conn, E.E., Paul K. Stumpf, George Brueming and Roy, H. Doi. 1987. John Wiley and Sons. New York.
Text Book of Biochemistry, 4th Edition. Edward S. West, Wilber R. Todd, Haward S. Mason & John T. Van Bruggan. 1966. The MacMillan Company. Collier-MacMillan Ltd. London.

Department of Biochemistry

Level 1, Semester II

COURSE NO. : BCHEM 124

Course Title : Metabolism of Biomolecules.

Credit hour : 1

Separation of albumins and globulins.
Determination of isoelectric pH.
Estimation of proteins by Kjeldahl and Biuret methods.
Determination of saponification value, iodine value and acid value.
Estimation of cholesterol.
Estimation of serum phosphorus.
Assay of SAP, SGPT and SGOT.

Books Recommended:

An introduction to practical Biochemistry, David T. Plummer 1995. Tata McGraw-Hill Publishing Company Limited, New Delhi.
Biochemical Calculations. How to Solve Mathematical Problem in General Biochemistry. Irwin H. Segel 1968. John Wiley and Sons, Inc. New York.
Biochemistry Laboratory Manual. F. M. Strong 1965. W.M.C. Brown Company Publishers, USA.
Biochemistry Laboratory Techniques, Sterling Chaykin 1970.. Wiley Eastern Private Limited, New Delhi.
Experimental Biochemistry, Gerald Litwack 1960.. A Laboratory Manual. John Liley and Sons. Inc, New York.
Official Methods of Analysis. Association of Official Analytical Chemists (AOAC), Washington D.C., 1990.
Practical Clinical Biochemistry. Verley, H.; Gowelock, A.H. and Bell, M. 1980. Vol. 1. William Heinemann Medical Books Ltd. London, U.K.

Department of Agronomy

Level -2, Semester-1

COURSE NO. : AGRON 211

Course title : Forage Agronomy

Credit hour : 2

Introduction to Agronomy: Definition and scope of Agronomy. Relationship of Agronomy with other branches of Agriculture.

Climatology: Concept of weather and climate. Effect of temperature, day length and solar radiation on growth, development and yield of crops. Cropping seasons of Bangladesh and their characteristics.

Crops and Cropping Systems: **Agronomic classification of crops. Methods of cropping. Crop suitability in different**

agroecological zones in Bangladesh. Distribution of crops in relation to season, soil and land topography.

Soil and Soil Management: Definition of soil. Physical and chemical properties of soil. Soil organic matter and soil organisms. Soil fertility and productivity.

Tillage: Concept, objectives and types of tillage. Effect of tillage on soil characteristics and nutrient availability. Characteristics of ideal tillage.

Plant Nutrition: Plant nutrient elements, their sources and forms of absorption. Functions and deficiency symptoms of nutrient elements in crop plants. Concept of manures and fertilizers.

Intercultural Operations: Weeding, mulching and thinning, irrigation and drainage– their objectives, methods, advantages and disadvantages.

Production Technology of Fodder Crops: Origin and distribution, botanical description, climate and soil requirements, cultivation practices of the crops used as animal feed and fodder such as maize, sorghum, triticale, rice; cowpea, soybean, barseem, alfalfa, sunnhemp, dhaincha, German grass: napier, para, guinea and pangola grasses.

Pasture and Pasture Management: Concept and importance of pasture. Pasture establishment, management of pasture, and pasture herbage utilization. Feasibility of pasturing in Bangladesh.

Department of Agronomy

Level -2, Semester-1

COURSE NO. : AGRON 212

Course title : Forage Agronomy

Credit hour : 1

Identification and study of farm implements
Identification and study of crops
Identification and study of seeds
Identification and study of weeds
Identification and study of manures and fertilizers
Practising ploughing and determination of efficiency of plough.
Practising weeding, thinning and gap filling.
Practising mulching operations.
Preparation of compost.
Preservation of farm yard manures.
Practising different methods of application of manures and fertilizers.
Preparation of silage
Preparation of hay
Purity test of seed
Germination test of seed.
Study of the effect of plant nutrients/seed rate/plant density on the performance of a fodder crop in students' plot.

Books Recommended (Agron 211 & 212)

1. Fundamentals of Agronomy. by De, G. C. 1995. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi. 429p.
2. Production of Field Crops. By Kipps, M. S. 1978. Tata McGraw Hill Pub. Co. Ltd. New Delhi. 790p.
3. Pasture and Pasture Plants. by Langer, R. H. M. 1973. A. H. & A. W. Reed Ltd. Wellington, Sydney, London.
4. Introduction to Agro-meteorology. By Mavi, H. S. 1974. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
5. Crop Production and Management, by Morachan, Y. B. 1993. 2nd Edition (Reprint). Oxford & IBH Publishing Co. Pvt. Ltd. New Delhi, Bombay, Calcutta. 294p.
6. Modern Techniques of Raising Field Crops, Singh, C. 1991. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
7. Principles and Practices of Agronomy, by Singh, S. S. 1996. 3rd Edition (Reprint). Kalyani Publishers, New Delhi.

Department of Computer Science & Mathematics

Level -1 , Semester -I

COURSE NO. : CSM. 112

Course Title : Computer Applications

Credit hour : 1

Computer science and computer fundamentals, hardware and software, data and information, information coding, number systems and their internal representation, program and algorithm.

Computer operations in DOS and Windows environment; familiarity with the use of application software: text processing, electronic sheet, data entry and management presentation materials preparation, statistical analysis, photoshop and illustration.

Books Recommended

Computer Science, France S, 5th Edition.
Office XP reference manual
Windows manual.