

reproductive disorders, Ultrasonography in domestic animals, Synchronization for reproductive management in domestic animals, Causes and management of repeat breeding, Diagnosis causes of anestrus, prolapse and its management, Uterine sample collection for culture sensitivity and endometrial biopsy, Diagnosis and prevention of abortion.

Recommended Books:

1. Zemjenis, R., 1970. Diagnostic & Therapeutic Techniques in Animal Reproduction. Williams & Wilkins Company, Baltimore
2. Morrow, D.A., 1986. Current Therapy in Theriogenology, II. W.B. Saunders Company, Philadelphia
3. Kahn, W., D. Wolkman, and R.M. Kenney, 1994. Veterinary Reproductive Ultrasonography, Mosby-Wolfe, London

SEMESTER IX

ANIMAL WELFARE AND ETHICS

2 (2-0)

Learning outcomes:

At the end of the course, students will be able to:

1. Enumerate international and national organizations working for animal welfare
2. Describe challenges of captive animals
3. Elaborate regulations, policies and principles governing care and use of laboratory animals
4. Describe various hazards affecting welfare of animals

Theory:

Care and welfare of different animal species, National / Provincial Legislation for Animal Welfare, Regulations, policies and principles governing the care and use of animals, Code of practice for domestic poultry, farm, captive, laboratory and companion animals, Hazards (Natural and Man-made) affecting the welfare of animals and their management, Difference between hazard and disaster, Ethics, Animal Welfare Organizations like Society for Prevention of Cruelty to Animals (SPCA), Challenges to Zoo and animal welfare, Setting Standards for Evaluating of captive Facilities.

Textbook:

1. Fraser, D., 2008. Understanding Animal Welfare: The Science in its Cultural Context. ISBN: 978-1-4051-3695-2 Wiley-Blackwell.

Recommended Books:

1. NAP, 1996 Guide for the care and use of Laboratory Animals, National Research Council, National Academy Press, Washington D.C.
2. Anonymous, 2014. Animal Welfare Act, Government of the Punjab. (www.punjab.gov.pk)
3. Clark. J. D, Baldwin, K. A., Bayne, M. J. Brown, G. F., Gebhart, J. C. Gonder, J. K. Gwathmey, M. E. Keeling, D. F. Kohn, J. W. Robb, O. A. Smith, W. J.

White, 1996. Guide for the Care and Management of Laboratory Animals. National Research Council, National Academic Press, Washington, D. C. 6th edition.

DAIRY TECHNOLOGY

2 (1-1)

Learning outcomes:

At the end of the course, students will be able to:

1. Describe composition and properties of milk
2. Describe processes involved in production, collection, transportation, processing and marketing of milk and milk products

Theory:

Mammary system, synthesis of milk, milk composition, milk let down and its inhibition, factors affecting milk production and composition, biotechnology and enhanced milk production, hand and machine milking, physical and chemical properties of milk, hygienic milk production, collection and transportation, processing and marketing of milk, cooling, homogenization and standardization, manufacturing of dairy products (yoghurt, butter, ghee, whey, cheese, etc.), planning, layout and management of dairy plant.

Practical:

Demonstration of milk let down, measures for hygienic milk production, manual and machine milking practice, physical and chemical analysis of milk, cleaning and sanitizing of barns, collection, cooling, tenderization, homogenization, pasteurization and UHT practices, economics of milk production and processing, visit to milk processing plants.

Textbook:

1. Walstra, P., 2005. Dairy Technology; Principles of Milk Properties and Processes. Marcel Dekker Inc, New York, USA.

Recommended Books:

1. Bath, D.L, F.N. Dickenson and H.A. Tucker, 1985. Dairy Cattle; Principles, Practices, Problems, Profits. Lea & fabiger, Philadelphia, U.S.A.
2. Davis, J.G., 1994. Milk testing. Agro-Botanical. Publications, India.
3. Larson, B.L., 1985. Lactation. The Iowa State University Press. Iowa.
4. Schmidt, G.H., L.D. Van Vlk and M.F. Hutjens, 1988. Principles of Dairy Science. 2nd Ed. Prentice Hall Inc. Englewood cliffs, New Jersey, U.S.A.

POULTRY PATHOLOGY

3 (2-1)

Learning outcomes:

At the end of the course, students will be able to:

1. Diagnose poultry diseases
2. Describe gross and microscopic pathology of different poultry diseases
3. Explain relationship of environment and nutrition with disease

Theory:

Pathology of various viral, bacterial, parasitic, fungal and nutritional diseases; environmental and managerial problems, intoxications.

Practical:

Hands-on practice on postmortem of poultry, common laboratory tests in poultry disease diagnosis, investigation of field outbreaks of disease, visits to poultry farms, hatcheries, research institutes and disease diagnostic laboratories.

Textbook:

1. Saif, Y.M., H. J. Barnes, J.R. Glisson, A.M. Fadly, L.R. McDougold, D.E. Swayne, 2003. Diseases of Poultry. 11th Ed., Iowa State University Press, Ames, Iowa, USA.

Recommended Books:

1. Randall, C. J., 1987. A Colour Atlas of Diseases of the Domestic Fowl and Turkey. ELBS/Wolfe Medical Publications London.
2. AAAP, 2000. Whiteman and Bickford's Avian Disease Manual 5th Ed., The American Association of Avian Pathologists, University of Georgia, USA.

LARGE ANIMAL SURGERY AND SHOEING**3 (2-1)****Learning outcomes:**

At the end of the course, students will be able to:

1. Surgically correct problems encountered in large animal practice
2. Perform foot care and hoof management
3. Describe and perform procedures of corrective shoeing.

Theory:

Scope of large animal surgery, Surgical affections of head, neck, ear, eye, teeth, thorax, claws, horn, tail, teats and udder of large animals. Affections: musculo-skeletal, digestive, urinary, male and female genital systems, integumentary system, Surgical management of colic, history and basic terms in shoeing; the horseshoe and shoe-nails, Hot and cold shoeing, Injuries caused by farrier, shoes, and nails, Affections of the foot, fore and hind limbs and corrective shoeing, blemishes and vices in animals, Dentition of large animals, Soundness.

Practical:

Ectropion, entropion and enucleation of eyeball, Ectropion, Various tenectomies and tendon repair and neurectomy, Temporary and Permanent Tracheotomy, and laryngeal diverticulectomy procedure, Oesophagotomy procedure, Oesophagotomy, practical demonstration, Rumenotomy procedure, Castration of farm animals and equine, Penile amputation, Methods of disbudding and dehorning and tail docking in cattle and buffaloes, Shoeing tools, Types of shoes and nails, Hot Shoe preparation, Application of shoes (removal of shoe, preparation of foot), Practices in determination of age from teeth, Soundness certificate writing.

Textbook:

1. Jennings. Jr. P. B., 1984. The Practice of Large Animal Surgery. W.B. Saunders Co., Philadelphia, USA.

Recommended Books:

1. Stashak, T. S. 1987. Adams' Lameness in Horses. 4th Ed. Lea and Febiger, Philadelphia, USA.
2. Venugopalan. A., 2000. Essentials of Veterinary Surgery 8th Ed. Oxford and IBH Publishers and Distributors, New Delhi, India.
3. Auer. J.A., 1999. Equine surgery. 2nd Ed. W.B. Saunders Co., Philadelphia. USA.
4. Colahan, P. T., I. G. Mayhew, A. M. Merritt and J. N. Moore, 1999. Equine Medicine and Surgery. 5th Ed. (Vol. 1 & 2). Mosby, Philadelphia. USA.
5. Turner, A.S. and C. W. Mcllwraith, 1989. Techniques in Large Animal Surgery. 2nd Ed. Lea & Febiger Philadelphia, USA.
6. Tyagi, R. P. S. and L. Singh, 1993. Ruminant Surgery. C.B.S. Publishers and Distributors, New Delhi, India.
7. Greenough, P. R., F. J. MacCallum and A. D. Weaver, 1997. Lameness in Cattle. 3rd Ed. Wright and Sons. Bristol, UK.
8. Pollitt, C. C., 1995. Colour Atlas of the Horse's Foot. Mosby-Wolfe, London, UK.
9. Emery, L., J. Miller and N. V. Vanhoosen, 1977. Horseshoeing Theory and Hoof Care. Lea and Febiger, Philadelphia, USA.

MEDICINE CLINIC-IV**2 (0-2)****Learning outcomes:**

At the end of the course, students will be able to:

1. Demonstrate knowledge and understanding of the clinical manifestations, diagnostic procedures, methods of treatment and typical pathologic abnormalities for common diseases of small and large animals.
2. Demonstrate knowledge of regulatory laws pertaining to the veterinary profession and handling of Vetrolegal cases.
3. Use radiographic and ultrasonography techniques in diseased diagnosis.
4. Demonstrate effective oral and written communication skills with veterinarians, animal health technicians, staff and the general public.
5. Develop and apply diagnostic and therapeutic strategies for common problems identified from the clinical evaluation of the animal.
6. Demonstrate role of Veterinarian in natural calamities and Veterinary disaster preparedness.
7. Exhibit altruism, integrity, honesty, responsibility, and compassion in the delivery of high quality animal healthcare
8. Develop core competencies in clinical case recording through independent case handling.

Clinic:

Practice of differential diagnosis of diseases with similar clinical signs, Cow signals (Body condition scoring, Udder scoring, Hoof scoring, Rumen scoring,

Fecal scoring, Gait scoring etc.), Biosecurity of livestock farms, Ultrasonography and Endoscopy, Training in ambulatory veterinary practice, Handling of Veterolegal cases, Role of Veterinarian in natural calamities and Veterinary disaster preparedness (flood, earthquakes, release of gases, radiations, drought and nuclear disaster), Professional films, World Trade Organization (WTO), Veterinarian's responsibility in preventing drugs residues in foods of animal origin, Veterinary profession interactions with health authorities, drug and food regulatory authorities, zoo/animal welfare organizations and civil administration, Social conduct and personality profile in management of clinical practice, Use of animals in research and training, Euthanasia, Assignment of indoor cases and maintaining their complete records, Independent handling, diagnosis and treatment of clinical cases, Recording of minimum 15 cases under the supervision of teacher and making a presentation after consulting veterinary information resources like journals, books and internet. Study tours to livestock farms, Zoo/Wildlife Parks and Veterinary Hospitals.

Recommended Books:

1. Radostitis, O.M., C.C. Gay, K.W. Hincheliff and P. D. Constable, 2007. Veterinary Medicine, 10th Ed. Saunders Elsevier, PA, USA.
2. Kelly, W. R., 1984. Veterinary Clinical Diagnosis. 3rd Ed. Bailliere Tindall & Corsell, London, U. K.
3. Kahn C.M., 2010. The Merck Veterinary Manual. 10th Ed. Merck & Company., INC, Whitehouse Station, N.J., USA.
4. Pinsent, P.J.N. and C.J. Fulle, 1997. Outline of Clinical Diagnosis in Horse. Blackwell Science, Oxford, UK.
5. Howard J.L, 1999. Current Veterinary Therapy, Food Animal Practice. W.B. Saunders, Co., U.S.A.
6. Hungerford. T.G., 1991, Hungerford's Diseases of Livestock 9th Ed. McGraw-Hill Book Company, Sydney, Australia.
7. Smith B.P., 1990. Large Animal Internal Medicine. The C.V. Mosby Company, Baltimore.

SURGERY CLINIC-IV

2 (0-2)

Learning outcomes:

At the end of the course, students will be able to:

1. Control and handle different animals for the purpose of surgical manipulations
2. Treat different animals brought for treatment
3. Deal with the clients.
4. Handle indoor and outdoor cases.

Clinic:

Handling surgical emergency cases, Fluid replacement therapy and blood transfusion in animals, Practice of passing stomach tube and stomach lavage, Back-racking, rectal palpation, Surgical management of choking, colic and grain overload, Management of urine retention cases, Application of plaster casts, Use of radiography and ultrasound as diagnostic tools, Group discussion on

cases received at the clinics and case presentations, Independent handling of surgical cases.

Recommended Books:

1. Speirs, V. C. and R. H. Wrigley, 1997. Clinical Examination of Horses. W. B. Saunders Co., Philadelphia, USA.
2. White II, N. A. and J. N. Moore, 1997. Current Techniques in Equine Surgery and Lameness, 2nd Ed. W. B. Saunders Co., Philadelphia, USA.
3. Stashak, T. S. 1987. Adams' Lameness in Horses. 4th Ed. Lea and Febiger. Philadelphia, USA.
4. Colahan, P. T., I.G. Mayhew, A. M. Merritt and J. N. Moore, 1999. Equine Medicine and Surgery, 5th Ed. (Vol. I & 2) Mosby, Philadelphia, USA.
5. Pollitt, C. C., 1995. Colour Atlas of the Horse's Foot. Mosby-Wolfe, Philadelphia, USA.
6. Kelly, W. R., 1984. Veterinary Clinical Diagnosis. 3rd Ed. Bailliere Tindall, London, UK.

THERIOGENOLOGY CLINIC - IV

2 (0-2)

Learning outcomes:

At the end of the course, students will be able to:

1. Explain the basics of reproductive management in dairy herds.
2. Demonstrate the handling of pre and post-partum reproductive disorders.
3. Establish the comprehension of better conception rate by managing infertility issues.

Clinic:

Systematic procedure for conducting clinical examination of female genitalia, evaluation of history (method, relevancy etc.), AI/breeding plans in multilevel dairy enterprises, AI procedures, practices etc. to increase pregnancy rate through AI in dairy herds, Synchronization programs in dairy herds, Diagnosis and treatment of uterine infections, Prevention and management of vaginal & uterine prolapse, Causes, prevention and management of retained placenta, Induction of parturition/abortion in farm animals, Cystic ovarian degeneration, Use of ultrasonography in reproductive management, Determination of gestation age in domestic animals, Methodologies to decrease calving interval, Reproductive management in canines (breeding time, semen evaluation), Dystocia management and post-partum care, Collection and examination of preputial samples of bulls.

Recommended Books:

1. Zemjenis, R., 1970. Diagnostic & Therapeutic Techniques in Animal Reproduction. Williams & Wilkins Company, Baltimore
2. Morrow, D.A., 1986. Current Therapy in Theriogenology, II. W.B. Saunders Company, Philadelphia
3. Kahn, W., D. Wolkman, and R.M. Kenney, 1994. Veterinary Reproductive Ultrasonography, Mosby-Wolfe, London.