

VETERINARY SURGERY AND RADIOLOGY
Course Structure – at a Glance

CODE	COURSE TITLE	CREDITS
VSR 601	PRINCIPLES OF SURGERY	2+0
VSR 602	CLINICAL PRACTICE – I	0+3
VSR 603	CLINICAL PRACTICE – II	0+3
VSR 604	SMALL ANIMAL ANAESTHESIA	2+1
VSR 605	LARGE ANIMAL ANAESTHESIA	2+1
VSR 606	DIAGNOSTIC IMAGING TECHNIQUES	2+1
VSR 607	VETERINARY OPHTHALMOLOGY AND DENTISTRY	1+1
VSR 608	SMALL ANIMAL SOFT TISSUE SURGERY	2+1
VSR 609	LARGE ANIMAL SOFT TISSUE SURGERY	2+1
VSR 610	ORTHOPAEDIC AND LIMB SURGERY	2+1
VSR 691	MASTER’S SEMINAR	1+0
VSR 699	MASTER’S RESEARCH	20
VSR 701	CLINICAL SURGICAL PRACTICE – I	0+2
VSR 702	CLINICAL SURGICAL PRACTICE – II	0+2
VSR 703	CLINICAL SURGICAL PRACTICE – III	0+2
VSR 704	ANAESTHESIA OF WILD AND LABORATORY ANIMALS	1+1
VSR 705	ADVANCES IN ANAESTHESIOLOGY	2+1
VSR 706	ADVANCES IN DIAGNOSTIC IMAGING TECHNIQUES	2+1
VSR 707	NEUROSURGERY	2+1
VSR 708	EXPERIMENTAL SURGICAL TECHNIQUES IN ANIMALS	1+1
VSR 789	SPECIAL PROBLEMS IN ANAESTHESIA	0+2
VSR 790	SPECIAL PROBLEMS IN SURGERY	0+2
VSR 791	DOCTORAL SEMINAR I	1+0
VSR 792	DOCTORAL SEMINAR II	1+0
VSR 799	DOCTORAL RESEARCH	45

VETERINARY SURGERY AND RADIOLOGY

Course Contents

VSR 601	PRINCIPLES OF SURGERY	2+0
Objective		
To impart the basic knowledge of principles of surgery.		
Theory		
<u>UNIT I</u>		
Wound healing, current concepts of inflammation and management, wound infections, antimicrobial therapy, principles of surgical asepsis, sterilization and disinfection.		
<u>UNIT II</u>		
Systemic effects of surgical stress, haemorrhage and haemostasis, metabolism of the surgical patient, fluid therapy in surgical patients, acid-base balance, shock. Hyperalimentation. Blood transfusion. Host defense mechanism.		
<u>UNIT III</u>		
Biomaterials, surgical immunity, pre-operative assessment of the surgical patient, post-operative care of the surgical patient. Chemotherapy of tumors.		
<u>UNIT IV</u>		
Operating room emergencies, cardio-pulmonary embarrassment and resuscitation, monitoring of surgical patient.		
<u>UNIT V</u>		
Principles of laser surgery, cryosurgery, electrosurgery, lithotripsy and endoscopy, physiotherapy, stem cell therapy etc.		
Suggested Readings		
Fossum TW. (Ed.). 2002. <i>Small Animal Surgery</i> . Mosby.		
Slatter DH. (Ed.). 2002. <i>Textbook of Small Animal Surgery</i> . WB Saunders.		
VSR 602	CLINICAL PRACTICE - I	0+3
Objective		
To impart practical training in anaesthesia, diagnostic imaging techniques and surgery.		
Practical		
Client management, public relations, code of conduct, management of surgical affections, designing of surgical hospital, hospital management, database management, attending surgical cases, surgical facilities, equipments, disaster management.		
Suggested Readings		
Auer JA. (Ed.). 2006. <i>Equine Surgery</i> . WB Saunders.		
Fossum TW. (Ed.). 2002. <i>Small Animal Surgery</i> . Mosby.		
Fubini SL & Ducharme NG. (Ed.). 2004. <i>Farm Animal Surgery</i> . WB Saunders.		
Slatter DH. (Ed.). 2002. <i>Textbook of Small Animal Surgery</i> . WB Saunders.		
VSR 603	CLINICAL PRACTICE - II	0+3
Objective		
To impart practical training in surgery, anaesthesia and diagnostic imaging techniques.		

Practical

Client management, animal welfare and rehabilitation, public relations, code of conduct, management of surgical affections, designing of surgical hospital, hospital management, database management, attending surgical cases, surgical facilities, equipments and personnel, disaster management.

Suggested Readings

- Auer JA. (Ed.). 2006. *Equine Surgery*. WB Saunders.
Fossum TW. (Ed.). 2002. *Small Animal Surgery*. Mosby.
Fubini SL & Ducharme NG. (Ed.). 2004. *Farm Animal Surgery*. WB Saunders.
Slatter DH. (Ed.). 2002. *Textbook of Small Animal Surgery*. WB Saunders.

VSR 604

SMALL ANIMAL ANAESTHESIA

2+1

Objective

To impart the basic and practical knowledge of principles of companion animal anaesthesia.

Theory

UNIT I

General considerations for anaesthesia, peri-operative and post-operative pain and its management.

UNIT II

Sedation: analgesia and pre-medication, anaesthetic agents (injectable anaesthetics, dissociative anaesthetics, inhalation anaesthetics), muscle relaxants, neuromuscular blocking agents and local analgesia.

UNIT III

Anaesthetic techniques, anaesthetic equipments, artificial ventilation.

UNIT IV

Anaesthesia of small animals, pediatric and geriatric patients, birds.

UNIT V

Monitoring of anaesthesia, anaesthetic emergencies, complications and their management, euthanasia.

Practical

Anaesthetic equipments and instrumentation, artificial ventilation, use of various preanaesthetic and anaesthetic agents in small animals, anaesthetic triad, balanced anaesthesia, total intravenous anaesthesia.

Suggested Readings

- Hall LW & Clarke KW. (Eds.). 1991. *Veterinary Anaesthesia*. Bailliere Tindall.
Paddleford RR. (Ed.). 1999. *Manual of Small Animal Anesthesia*. 2nd Ed. WB Saunders.
Thurmon JC, Tranquilli WJ & Benson JG. (Eds.). 1996. *Lumb and Jone's Veterinary Anaesthesia*. Williams & Wilkins.
Thurmon JC, Tranquilli WJ & Benson JG. (Eds.). 1999. *Essentials of Small Animal Anesthesia and Analgesia*. Lippincott Williams & Wilkins.

VSR 605

LARGE ANIMAL ANAESTHESIA

2+1

Objective

To impart the basic and practical knowledge of principles of farm animal anaesthesia and mechanism of pain.

Theory

UNIT I

General considerations for anaesthesia, peri-operative pain, and post-operative pain and its management.

UNIT II

Pre-anaesthetic and anaesthetic adjuncts, injectable anaesthetics, dissociative anaesthetics, inhalation anaesthetics.

UNIT III

Local anaesthetics, neuromuscular blocking agents.

UNIT IV

Anaesthetic techniques, anaesthetic machines, breathing systems, artificial ventilation.

UNIT V

Monitoring of anaesthesia, anaesthetic emergencies and complications, anaesthesia of pediatric and geriatric patients, euthanasia.

Practical

Anaesthetic equipments and instrumentation, artificial ventilation, use of various preanaesthetic and anaesthetic agents in large animals, anaesthetic triad, balanced anaesthesia, total intravenous anaesthesia.

Suggested Readings

Hall LW & Clarke KW. (Eds.). 1991. *Veterinary Anaesthesia*. Bailliere Tindall.

Muir WW & John AE. (Eds.). 1991. *Equine Anesthesia*. Mosby.

Thurmon JC, Tranquilli WJ & Benson JG. (Eds.). 1996. *Lumb and Jone's Veterinary Anaesthesia*. Williams & Wilkins.

VSR 606

DIAGNOSTIC IMAGING TECHNIQUES

2+1

Objective

To impart the basic and practical knowledge of principles of diagnostic imaging techniques and interpretation of radiographs, ultrasonograph/CT/MRI and other imaging techniques.

Theory

UNIT I

Conventional and digital X-ray machine, quality of radiation, formation of radiograph technique chart, artifacts and their prevention, special diagnostic radiographic procedures, radiographic quality, radiographic accessories, differentiation of radiographic densities in relation to clinical diagnosis.

UNIT II

Principles of radiographic interpretation, plain and contrast radiographic techniques of small and large animals, image intensification.

UNIT III

Principles of radiation therapy, medical radioisotope curves, radiation laws and regulations.

UNIT IV

Principles of ultrasound, basic physics, transducers, equipment controls, display models, terminology of echotexture and artifacts, application of ultrasound in small and large animals.

UNIT V

Doppler techniques echocardiography and its application, introduction to MRI, CT scan, nuclear medicine, xeroradiography, positron emission tomography technique and other imaging techniques.

UNIT VI

Electromagnetic radiations, hazards of electromagnetic radiations and protection and bio-safety.

Practical

Acquaintance with imaging equipments, dark room processing techniques and X-ray film handling, formulation of technique chart with fixed kVp and variable mAs, basics of radiographic interpretation of diseases, computer aided image acquisition and retrieval, radiographic positioning of different regions in domestic animals, angiography, cardiac catheterization and other contrast radiographic techniques of different types, interpretation of ultrasonographs, MRI, CT scans etc.

Suggested Readings

- Bargai U, Bharr, JW & Morgan JP. (Eds.). 1989. *Bovine Radiology*. Iowa State University Press, Ames.
- Bushong SC. (Ed.). 1975. *Radiologic Science for Technologists*. CV Mosby.
- Gillette EL, Thrall DE & Lebel JL. (Eds.). 1977. *Carlson's Veterinary Radiology*. Lea & Febiger.
- Goddard PJ. (Ed.). 1995. *Veterinary Ultrasonography*. CABI.
- Kealy JK. (Ed.). 1987. *Diagnostic Radiology and Ultrasonography in Dogs and Cats*. 2nd Ed. Saunders, Philadelphia.
- Morgan JP. (Ed.). 1972. *Radiology in Veterinary Orthopaedics*. Lea & Febiger.
- Singh AP & Singh J. (Eds.). 1994. *Veterinary Radiology*. CBS.
- Thrall DE. (Ed.). 2007. *Textbook of Veterinary Diagnostic Radiology*. 5th Ed. Saunders, Philadelphia.

VSR 607

VETERINARY OPHTHALMOLOGY AND DENTISTRY

1+1

Objective

To impart the basic and practical knowledge of diagnosis and treatment of diseases of eye and teeth in domestic animals.

Theory

UNIT I

General Anatomical and physiological considerations for ophthalmic surgery.

UNIT II

Ophthalmic examination and diagnosis, local anaesthesia of eye, ocular therapeutics, diagnostic instruments.

UNIT III

General consideration for eye surgery, diseases and surgery of eye lids, lacrimal apparatus, naso-lacrimal duct.

UNIT IV

Diseases of conjunctiva, cornea, sclera, iris, orbit, lens, vitreous and aqueous humor, retina and optic nerve.

UNIT V

Ocular manifestation of systemic diseases.

UNIT VI

Anatomy of teeth, examination of teeth. Diseases of teeth- congenital anomalies (retained deciduous teeth, impacted teeth, abnormalities in the shape of teeth). Diseases of teeth- acquired diseases (dental caries, fracture of teeth, endodontic disease, dental materials and dental radiography). Restorative dentistry, periodontal disease, tooth extraction, gum diseases. Current techniques in dentistry.

Practical

Ophthalmic instrumentation, examination of the eye and its adnexa, preparation of patient for eye anaesthesia and surgery, canthotomy, tarsorrhaphy, transplantation of cornea, keratoplasty, anterior chamber paracentesis, flushing of naso-lacrimal duct, iridectomy, lens extraction/implantation. Dentistry instrumentation, dental radiography, teeth cleaning, tooth extraction.

Suggested Readings

- Gelatt KN. (Ed.). 1981. *Veterinary Ophthalmology*. Lea & Febiger.
Gelatt KN. (Ed.). 2007. *Atlas of Veterinary Ophthalmology*. 4th Ed. Blackwell Publ.
Gelatt KN. (Ed.). 2000. *Essentials of Veterinary Ophthalmology*. Blackwell.
Lavach JD. (Ed.). 1990. *Large Animal Ophthalmology*. CV Mosby.
Oehme FW & Prier JE. (Eds.). 1974. *Textbook of Large Animal Surgery*. Williams & Wilkins.
Slatter DH. (Ed.). 1981. *Fundamentals of Veterinary Ophthalmology*. WB Saunders.
Tyagi RPS & Singh J. (Eds.). 1993. *Ruminant Surgery*. CBS.

VSR 608

SMALL ANIMAL SOFT TISSUE SURGERY

2+1

Objective

To familiarize with various surgical affections of different body systems and their treatment in small animals.

Theory

UNIT I

Skin and adnexa- the integument, management of skin wounds, principles of plastic and reconstructive surgery, pedicle grafts, skin grafts, burns, electrical chemical and cold injuries.

UNIT II

Surgical approaches/ affections of ear, oral cavity and pharynx, abdomen, thorax, the salivary glands, oesophagus, stomach, intestines, rectum and anus, liver and biliary system, pancreas.

UNIT III

Hernias- abdominal hernia, diaphragmatic hernia, perineal hernia, inguinal, scrotal, and umbilical hernia etc. Surgical approaches to thoracic wall, Pleura.

UNIT IV

Respiratory system- functional anatomy, diseases of upper respiratory system and lower respiratory system.

UNIT V

Surgical anatomy of the cardiovascular system, cardiovascular physiology, diagnostic methods, cardiac disorders, principles of vascular surgery, basic cardiac procedures, hypothermia, basic peripheral vascular procedures, peripheral vascular disorders, portacaval shunts and anomalies. Haemolymphatic system, bone marrow, spleen, tonsils, lymph nodes and lymphatics, thymus.

UNIT VI

Male reproductive system- anatomy of the male genital organs, diagnostic and biopsy techniques, surgical affections of male genital organs; female reproductive system- anatomy, diagnostic techniques, surgical affections of female genital organs.

UNIT VII

Urinary system- anatomy of the urinary tract, principles of urinary tract surgery, kidneys, ureters, surgery of the bladder, surgical diseases of the urethra, medical dissolution and prevention of canine uroliths, feline urologic syndrome.

UNIT VIII

Endocrine system- pituitary, adrenals, thyroid, parathyroid, surgical affections of mammary glands and tail. Surgical affections of nervous system, special sense organs.

Practical

Practice of various surgical techniques of skin and adnexa, alimentary system, hernias, respiratory system, cardiovascular system, male and female reproductive systems, urinary system, mammary glands and tail.

Suggested Readings

Fossum TW. (Ed.). 2002. *Small Animal Surgery*. Mosby.

Slatter DH. (Ed.). 2002. *Textbook of Small Animal Surgery*. WB Saunders.

VSR 609

LARGE ANIMAL SOFT TISSUE SURGERY

2+1

Objective

To familiarize with various surgical affections of different body systems and their treatment in large animals.

Theory

UNIT I

Abdominal wall, integumentary system - skin and appendages; mammary gland, tail, affections of oral cavity.

UNIT II

Surgical affections of respiratory system, cardiovascular and lymphatic system.

UNIT III

Surgical affections of digestive system, urinary and genital system.

UNIT IV

Surgical affections of nervous system, special sense organs.

Practical

Practice of various surgical techniques of skin, alimentary system, hernias, respiratory system, cardiovascular system, male and female reproductive system, urinary system, mammary glands and tail. Surgical affections of nervous system, special sense organs.

Theory

UNIT I

Considerations for general anaesthesia, drug interactions in anaesthesia, perioperative pain and distress, effects of anaesthetics on CNS function.

UNIT II

Pharmacology of preanaesthetics and anaesthetic adjuncts; injectable anaesthetics; dissociative anaesthetics; inhalation anaesthetics; local anaesthetics; muscle relaxants and neuromuscular blocking agents.

UNIT III

Anaesthetic machines and breathing system, airway management and ventilation, acid-base physiology and fluid therapy during anaesthesia, monitoring of anaesthetized patients, anaesthetic emergencies and accidents.

UNIT IV

Anaesthesia for selected diseases (cardiovascular dysfunction, pulmonary dysfunction, neurologic diseases, renal diseases, hepatic diseases, gastrointestinal diseases, endocrine diseases, airway diseases).

UNIT V

Anaesthesia for special patients (ocular patients, heart patients, caesarian section patients, trauma patients, neonatal and geriatric patients), euthanasia.

Practical

Various procedures for catheterization of heart and great vessels, haemodynamic changes and pulmonary function tests during trials of anaesthetics, electrocardiographic, encephalographic evaluation of central nervous system activity, cybernetics, data acquisition and retrieval.

Suggested Readings

Selected articles from journals.

VSR 706 ADVANCES IN DIAGNOSTIC IMAGING TECHNIQUES 2+1

Objective

To impart the advanced theoretical and practical knowledge of diagnostic imaging techniques and their interpretations.

Theory

UNIT I

Biological effects of radiations (alpha, beta, X-ray and gamma rays) *in vivo* and *in vitro* cellular response following radiation as an immunosuppressive agent.

UNIT II

Isotopes (natural and man-made); cyclotron reactor, half-life, decay pattern, storage and handling of radioactive material, fluoroscopy, magnetic resonance imaging and computerised axial tomography, xeroradiography, doppler techniques, indications for ultrasound diagnosis.

UNIT III

Methods in the detection of isotopes, Geiger-Muller tubes, photo-multiplier tube, medical use of isotope, dosimetry, nuclear medicine and its use in diagnosis of thyroid, kidney, bone and liver function studies.

UNIT IV

Labelling of isotope and biological uses, detonation and fission products.

UNIT V

Radiation therapy in cancer patients, biological effects of radiation physics, physics of radiation.

UNIT VI

Doppler techniques echocardiography and its application, MRI, CT scan, nuclear medicine, xeroradiography, positron emission tomography technique etc.

UNIT VII

Electromagnetic radiations, hazards of electromagnetic radiations and protection and bio-safety.

Practical

Radiation safety measures, handling radioactive material, measurement of thyroid function and cardiac output, demonstration of advanced radiological techniques.

Suggested Readings

Selected articles from journals.

VSR 707

NEUROSURGERY

2+1

Objective

To impart theoretical and practical knowledge of treatment of surgical affections of nervous system in animals.

Theory

UNIT I

Nervous system- anatomy and physiology.

UNIT II

Clinical neurology, pathogenesis of disease of the central nervous system.

UNIT III

Diagnostic methods- electrodiagnostic methods, neuroradiology.

UNIT IV

Fundamentals of neurosurgery, surgical approaches to brain, surgical diseases of peripheral nerves, surgical approaches to the spine, diseases of the spinal column, intervertebral disc diseases.

UNIT V

Intracranial surgery.

Practical

Instrumentation, neurological examination, imaging the spine; skull and brain, surgical approach to the cervical spine; thoracolumbar spine and brain.

Suggested Readings

Selected articles from journals.

VSR 708

EXPERIMENTAL SURGICAL TECHNIQUES IN ANIMALS

1+1

Objective

To familiarize with designing of experiments and various surgical models for research.

Theory

UNIT I

General considerations and protocols for designing experiments.

