
(4)	FOURTH PROFESSIONAL	
	Veterinary Surgery and Radiology	2+1=3
	Veterinary Medicine	4+1=5
	Veterinary Gynaecology and Obstetrics	2+1=3
	Veterinary Clinical Practices –II	0+6=6
		Total 8+9=17

(xv) **DEPARTMENT OF VETERINARY SURGERY AND RADIOLOGY**
VETERINARY SURGERY AND RADIOLOGY

Credit Hours:2+1

THEORY

UNIT-1(VETERINARY GENERAL SURGERY)

Introduction: Historical perspective, Definitions, classification of surgery, tenets of Halsted. Pre-operative, intra-operative and post-operative considerations: History taking, physical examination, clinico-pathological testing, intra-operative and postoperative care.

Sterilization and disinfection: Definitions, surgical sterilization, various methods of sterilization (Heat, chemical and radiations etc.), disinfections.

Sutures: Definitions, suturing, factors influencing suturing, characteristics of an ideal suture material, types of suture material-absorbable and non-absorbable, surgical knots, various suture patterns-apposition, eversion, inversion and special.

Treatment of acute and chronic inflammation: Use of anti-inflammatory drugs and proteolytic enzymes. Haemostasis (physical and chemical methods, systemic haemostats, surgical diathermy)

Basic surgical affections: Definitions, classification, diagnosis and treatment of abscess, tumour, cyst, hernia, haematoma, necrosis, gangrene, burn and scald, frost bite and surgical affections of muscles, artery and vein, sinus and fistula.

Wounds: Definition, classification, examination and diagnosis, general principles for treatment of aseptic, contaminated and septic wounds, healing and factors affecting wound healing, complications of wounds and their remedies. Surgical infection; their prevention and management: Classification of infection, Introduction to biomaterials and stem cell therapy in wound management

Management of surgical shock. Principles of fluid therapy in surgical patients.

UNIT-2 (VETERINARY ANAESTHESIOLOGY)

Introduction: Development of anaesthesiology, Terminology, classification and indications. General considerations of anaesthesia: Factors affecting anaesthesia and selection of anaesthetic technique, factors modifying uptake, distribution and elimination, patient evaluation, categories of patients according to physical status, selection of anaesthetic agent and patient preparation. Pain and its management in animals Local and regional anaesthesia: Definitions, local anaesthetics, mechanism of action Premedication, properties and use of different preanaesthetics: Uses of premedication, ,

Anticholinergic, sedatives and tranquilizers (Phenothiazine derivatives, Benzodiazepines, Butyrophenones, Narcotic analgesics, Alpha-2 agonists, dosage chart of all the drugs.

General anaesthesia: Definitions, methods of induction of anaesthesia, Intravenous anaesthetics (Total intravenous anaesthesia), monitoring of anaesthesia.

Inhalation anaesthesia: Advantages of inhalant anaesthetics, types of inhalant anaesthetics their properties and effect on various systems, methods of administration of inhalant anaesthesia.

Dissociative anaesthesia: Definition, drugs, clinical application, properties and effect on various body systems.

Avian, wild, zoo, exotics and lab animal anaesthesia and capture myopathy

Anaesthetic emergencies and management, Toxicity, antidote and reversal agents.

UNIT-3 (VETERINARY DIAGNOSTIC IMAGING TECHNIQUES)

Introduction to Radiology-General terminology of radiology, Physical properties of X-Rays, Scope and uses of Radiology, Directional terms for veterinary radiology. Production of X-rays and factors influencing production of X-rays. Radiation hazards and safety measures- Scattered radiation, Biological effects of radiation, Direct and indirect effects, Early and late effects, Radiation sensitivity of different body cells, Radiation protection, General principles of radiation safety, Radiation monitoring devices, Requirement of an ideal radiographic section. The statutory requirements of radiology set-up as per Atomic Energy Regulatory Board of India (AERB). Production of quality diagnostic radiograph. Recording of image- Manual and digital processing of X-ray films, storage and retrieval system. Radiographic Quality and faults- Radiographic detail, density and contrast and factors affecting them, Radiographic faults, their possible causes and prevention. Contrast radiography- Definition, indications, contraindications and types of contrast radiography, Different contrast materials and their use, Techniques of some selected contrast radiography in animals(Barium swallow, Retrograde urography etc) Diagnostic ultrasonography- Principles, indications, techniques and artifacts of ultrasonography. Advanced diagnostic imaging tools- The brief introduction to the use and limits of some advanced imaging techniques, Interventional radiology - CAT scanning, MRI, etc

UNIT-4: (REGIONAL SURGERY-I)

Head and Neck: Affections of lips, cleft palate, tongue, cheek, and their treatment: General anatomical considerations, avulsion of lip, cleft lip ranula, neoplasm and traumatic injuries. Affections of teeth and jaws and their treatment: General anatomical considerations, Developmental abnormalities, dental tartar, periodontal disease, overgrown molars, fractures and luxations of jaw. Affections of nose, face, ear, head and horn and their treatment: General anatomical considerations.

Brachycephalic syndrome, Stenotic nostrils, nasal polyps, empyema of sinuses, fracture and avulsion of horn, horn cancer, aural haematoma, otitis. Affections of eye and their treatment: General anatomical considerations and examination of eye. Affections of eyelids and nictitating membrane and their treatment: entropion, ectropion, chalazion, sty, Cherry eye and traumatic injuries. Affections of lachrymal apparatus, eyeball and orbit and their treatment: occlusion of nasolacrimal duct, traumatic proptosis, panophthalmia, orbital neoplasms, glaucoma, eye worms. Affections of cornea, iris and lens and their treatment: corneal ulcers, corneal opacity, Kerato Conjunctivitis Sicca (KCS), prolapse of iris, corneal dermoid, corneal lacerations and perforations, cataract. Affections of guttural pouch, oesophagus and their treatment: General anatomical considerations. Empyema, tympanitis and Mycosis of guttural pouch, oesophageal diverticulum, megaesophagus, achalasia and choke. Affections of glands of head and neck and their treatment: General anatomical considerations. Salivary mucocele, sialoliths, salivary fistula Affections of neck and their treatment: General anatomical considerations. Yoke gall, yoke abscess, fistulous withers, poll evil, torticollis. Affections of larynx and Trachea: Tracheal collapse, stenosis, roaring in horses, dorsal entrapment of soft palate in horses and camels, emergency tracheotomy. Management of ocular emergencies. Tracheotomy

UNIT-5: (REGIONAL SURGERY-II)

Thorax and Abdomen: Thoracic affections: Surgical approaches, perforated wounds, pyothorax, pneumothorax, pneumocele, Diaphragmatic hernia and traumatic pericarditis in cattle. Abdominal affections: Surgical approach to the abdomen in different animal species. Common surgical affections of the stomach in dogs and their management: dilation and torsion of stomach, gastric ulcerations, foreign bodies in the stomach, pyloric stenosis. etc Surgical affections of the stomach in large animal and their management: Ruminal impaction, traumatic reticulitis, omasal and abomasal impaction and abomasal displacement. Surgical affections of small intestines and their management: Intestinal obstruction, intussusception and strangulation (volvulus). Techniques of intestinal anastomosis. Surgical affections of large intestine and their management: Caecal dilatation and torsion, rectal prolapse, rectal and perineal tear, recto-vaginal fistula. Surgical affections of anus and perineal region and their management: Atresia-ani, anal stenosis, anal sac impaction. Other surgical affections of abdomen and their management: Perforating wounds and fistulae of abdomen, umbilical hernia, ventral abdominal hernia, inguinal and scrotal hernia, perineal hernia. Urinary system: Urolithiasis and its management. Urolithiasis in small and large animals. Patent urachus, ectopic ureter. Surgical management of equine colic. Genital system: Surgical affections of male genital system and their management, prostatic enlargement or hyperplasia or neoplasm, Phimosis, paraphimosis, preputial prolapse, penile amputation. Castration, vasectomy, scrotal ablation in large and small animals. Surgical affections of female genital system and their management: Canine transmissible venereal tumour. Ovariohysterectomy and caesarean section. Applications of rigid and flexible endoscopes in the management of surgical disorders. Integumentary system: Surgical affections of udder, teat and canine mammary neoplasms. Surgical affections of tail and tail docking Wildor zoo animal surgery (only awareness)

UNIT-6 (ORTHOPEDECS AND LAMENESS)

Body conformation of the horse in relation to lameness (trunk, fore limb and hind limb).

Lameness: Its definition classification and diagnosis. General methods of therapy for lameness. Body and limb conformation in relation to lameness in equine.

Equine lameness: Shoulder slip (sweeny), bicipital bursitis, omarthritis, capped elbow, radial paralysis, carpalitis. bent knee, and knock- knee. Hygroma of knee, open knee, blemished knee. Fracture of carpal bone, fracture of accessory carpal, contraction of digital flexors. Splints, sore shin, wind puffs, sesamoiditis, Osstots, ringbone, quittor, side bone, Navicular disease, pyramidal disease. Laminitis, sand crack, seedy toe, fractures of third phalanx, pedal osteitis, and sole penetration. Canker, thrush and corn, Monday morning disease, cording up, myositis of psoas, Mac thrombosis, Crural paralysis, subluxation of sacroiliac joint rupture of round ligament trochanteric bursitis. Upward fixation of patella, stringhalt, gonitis, chondromalacia of patella, rupture of tendoachilles, rupture of peroneus tertius, fibrotic myopathy and ossifying myopathy. Thoroughpin, bog spavin, spavin, curb, capped hock.

Canine lameness: Intervertebral disc diseases, elbow and hip dysplasia, rupture of cruciate ligament, elbow hygroma etc.; their management, Onychectomy.

Bovine lameness: Contusion of sole, ulceration of sole, septic laminitis, avulsion of hoof and subluxation of patella, interdigital fibroma, cyst, sand crack, and hoof deformities.

Fracture: Definitions, classification, fracture healing and complications.

Fracture: The preliminary assessment and management of fractures. Techniques of external immobilization of fractures.

Techniques of internal immobilization of fractures. Management of fracture complications

Luxations: Definition, signs, diagnosis. Management of common joint luxations in animals.

Spinal trauma, diagnosis and its management

Rehabilitation and physiotherapy of orthopaedic patients

PRACTICAL**UNIT-1(VETERINARY GENERAL SURGERY)**

Introduction to layout of operation theatre and surgical unit. Introduction of common surgical equipment and instruments. Suture materials, surgical knots and suture patterns. General examination of surgical patients. Preparation of surgical patients. Other operation theatre routines like sterilization, preparation of theatre, Surgeon and surgical pack. Bandaging and basic wound management Demonstration (or Audio visual aids) of surgery, control of haemorrhage and suturing

UNIT-2 (VETERINARY ANAESTHESIOLOGY)

Familiarization with anaesthetic apparatus, monitoring equipment and accessories. Methods of local infiltration analgesia (Linear ring block, inverted L block etc.) Regional nerve block demonstration and practice (Auriculopalpebral block, Peterson block or 4 point retrobulbar nerve block, Paravertebral, epidural etc.) Intravenous regional anaesthesia in cattle. Administration of general anaesthesia in small and large animals. (Demonstration and practice). Administration of inhalant anaesthesia (Demonstration). Monitoring of general anaesthesia. Management of anaesthetic emergencies, use of artificial respirator and analeptics. Visit to a wild animal facility or audio-visual aids or both.

UNIT-3 (VETERINARY DIAGNOSTIC IMAGING TECHNIQUES)

Familiarization with the operation of the x-ray unit. Formulation of X-ray exposure technique charts, Adoption of safety measures and film processing. Positioning and radiography of different parts of the body in small and large animals Handling, viewing and interpretation of radiograph. Familiarization with the film contrast, density and details, common radiographic artifacts. Radiographic pathology of the head, neck and thorax of large and small animals. Radiographic pathology of abdomen of large and small animals. Radiographic pathology of the bones and joints of large and small animals. Demonstration of contrast radiographic techniques in animals. Demonstration of ultrasonography in animals. Fluoroscopy or Image intensifier (familiarization).

UNIT-4: (REGIONAL SURGERY-I)

Demonstration or Audio visual aids: Amputation of horn and disbudding. Tooth rasping, dental scaling. Examination of ear (otoscopy). Examination of eye (General examination, Ophthalmoscopy, tonometry, fluorescein dye test, Scherimer tear test, test for blindness). Operation for aural haematoma. Protection and bandage of eyes, tarsorrhaphy, third eyelid flap, flushing of nasolacrimal duct

UNIT-5: (REGIONAL SURGERY-II)

Demonstration or Audio visual aids-Castration in different species in clinical cases and under animal birth control programme in canine. Ovariohysterectomy in dogs and cats. Rumenotomy, Gastrotomy in dogs, Urethrotomy and urethrostomy. Cystotomy and cystorrhaphy. Enterotomy or Enterectomy. Management of teat and udder affections. Amputation of tail in different animals in clinical cases. Circumcision operation for prepuce and rectal prolapse. Thoracocentesis and abdominocentesis.

UNIT-6 (ORTHOPEDICS AND LAMENESS)

Demonstration or Audio visual aids-Familiarization with various orthopaedic instruments and implants. Basic orthopaedic and neurological examination in small and large animals. Nerve blocks in equine. Application of basic physiotherapy techniques in animals. Basic limb stabilization techniques and splinting techniques. Application of cast in small and large animals. Internal fixation techniques in animals. Medial patellar desmotomy in bovines. Examination of animals for soundness and preparation of soundness certificate.

ANNUAL EXAMINATION

PAPERS	UNITS	MAXIMUM MARKS	WEIGHTAGE
THEORY			
Paper-I	1, 2, 3 and 4	100	20
Paper-II	5 and 6	100	20
PRACTICAL			
Paper-I	1, 2, 3 and 4	60	20
Paper - II	5 and 6	60	20

(xvi) DEPARTMENT OF VETERINARY MEDICINE**VETERINARY MEDICINE****Credit Hours: 4+1****THEORY****UNIT-1 (GENERAL)**

History and scope of Veterinary Medicine, concept of animal diseases. Concepts of diagnosis, differential diagnosis, treatment and prognosis. General systemic states, hyperthermia, hypothermia, fever, septicemia, toxemia, shock, allergy, anaphylaxis, oedema, coma, anaemia, common clinical poisonings and dehydration.

Estimates of diseases, patterns of disease, disease monitoring and surveillance, herd health and quarantine.

UNIT-2 (SYSTEMIC DISEASES)

Etiology, clinical manifestations, diagnosis, differential diagnosis, treatment, prevention and control of the following diseases of cattle, buffalo, sheep, goat, horse, pig, dog, cat and poultry: Diseases of digestive, respiratory, cardiovascular, urinary, nervous, musculoskeletal, haemopoietic, and lymphatic systems, skin, sense organs

including affections of peritoneum, liver and pancreas. Emergency medicine and critical care.

UNIT-3 (METABOLIC AND DEFICIENCY DISORDERS)

Diagnosis and management of diseases caused by deficiency of iron, copper, cobalt, zinc, manganese, selenium, calcium, phosphorus, magnesium, iodine, vitamin A, D, E, B complex, K and C. Diseases of neonates, Alternative or integrated or ethno veterinary medicine in animal disease management. Aetiology, clinical manifestations, diagnosis, differential diagnosis, treatment prevention and control of metabolic or production and endocrine diseases of cattle, buffalo, sheep, goat, horse, pig, dog, cat and poultry i.e. Milk fever, eclampsia, osteodystrophy fibrosa, lactation tetany, downer cow syndrome, ketosis, fat cow syndrome, hypomagnesaemia, Nutritional haemoglobinuria, azoturia, diabetes, hypothyroidism, Cushing syndrome, Addison's disease and Gout.

UNIT-4 (ZOO AND WILD ANIMAL MEDICINE)

Principles of zoo hygiene, public health problems arising from zoos. Prevention, control and treatment of infectious, parasitic, nutritional and metabolic diseases in zoo and wild animals including exotic birds. Acts and Rules related to Zoo and wild animals. National and international organizations and institutions interlinked to wild and zoo animals – role and functioning.

UNIT-5 (BACTERIAL, FUNGAL AND RICKETTSIAL DISEASES)

Aetiology, epidemiology, clinical manifestations, diagnosis, treatment, prevention and control of bacterial, fungal and rickettsial diseases of livestock: mastitis, hemorrhagic septicaemia, brucellosis, tuberculosis, Johne's disease, listeriosis, leptospirosis, campylobacteriosis, actinomycosis, actinobacillosis, bordetellosis, glanders, strangles, ulcerative lymphangitis, colibacillosis, fowl typhoid, pullorum disease, fowl cholera, avian mycoplasmosis, spirochaetosis, salmonellosis, swine erysipelas, contagious caprine pleuropneumonia, contagious bovine pleuropneumonia, anthrax, clostridial infections, ehrlichiosis, chlamydiosis, Q fever, anaplasmosis, dermatophilosis, aspergillosis, candidiasis, histoplasmosis, sporotrichosis, coccidioidomycosis, mycotoxicosis and rhinosporidiosis.

UNIT-6 (VIRAL AND PARASITIC DISEASES)

Aetiology, epidemiology, clinical manifestations, diagnosis, treatment, prevention and control of viral and parasitic diseases of diseases of cattle, buffalo, sheep, goat, horse, pig, dog, cat and poultry: Foot and mouth disease, rinderpest, bovine viral diarrhoea, malignant catarrhal fever, infectious bovine rhinotracheitis, ephemeral fever, blue tongue, sheep pox, goat pox, PPR, classical swine fever, rabies, equine influenza, equine infectious anemia, equine rhinopneumonitis, canine distemper, infectious canine hepatitis, canine parvoviral disease, corona viral infection, adeno virus infection, feline rhinotracheitis, feline pan leucopenia, feline infectious peritonitis, avian influenza, New Castle disease, Marek's disease, avian leucosis, infectious bronchitis, infectious laryngotracheitis, avian encaphalomyelitis, chicken reo virus, fowl pox, infectious bursal disease, chicken infectious anemia, inclusion body hepatitis-hydropericardium syndrome, emerging and exotic viral diseases of global importance.

Parasitic diseases: Trematodes, cestodes, nematodes, protozoan infections and external parasites of clinical importance.

UNIT-7 (JURISPRUDENCE, ETHICS, AND ANIMAL WELFARE)

Legal duties of veterinarians, laws related to medicine, evidence, common offences against animals and laws related to these offences. Examination of living and dead animals in criminal cases. Cruelty to animals and bestiality. Legal aspects of: Examination of animals for soundness, examination of injuries and post-mortem examination. Causes of sudden death in animals. Collection and despatch of materials for chemical examination, detection of frauds-doping, alternation of description, bishoping etc. Cattle slaughter and evidence procedure in courts. Provincial and Central Acts relating to

animals. Glanders and Farcy Act 1899 (13 of 1899). Dourine Act 1910 (5 of 1910), Laws relating to offences affecting Public Health. Laws relating to poisons and adulteration of drugs. Livestock importation act, liability and insurance. Code of conduct and ethics for veterinarians - the regulations made under the Act.

Animal welfare organizations and its role in animal welfare, welfare assessment, behaviour and animal welfare, principles and philosophy of animal welfare, animal welfare ethics, improving animal welfare through legislation and incentives, assessment of physiological, behavioural, disease and production measures of animal welfare, assessing welfare in practice, environment enrichment, euthanasia, welfare of animals used in education and research and transportation, religion and animal welfare, human and animal welfare conflict, veterinary disaster management, human-animal interactions, economics and animal welfare and veterinarians as animal welfare educators

PRACTICAL

UNIT-1 (GENERAL)

Collection of history and general clinical examination. Collection, preservation, packing and dispatch of samples from clinical cases. Nasogastric and orogastric intubation in animals. Oxygen therapy in veterinary practice. Gastric and peritoneal lavage. Collection and examination of cerebrospinal fluid. Blood transfusion .

UNIT-2 (SYSTEMIC DISEASES)

Special examination of cardiovascular system. Examination of urinary system. Special examination of respiratory system. Special examination of gastrointestinal system. ECG, Echocardiography, Ultrasonography, Endoscopy. Special examination of sense organs. . Examination of eye and ear. Collection and examination of peritoneal fluid. Peritoneal dialysis. Neurological examination in animals. Lymph node biopsy and bone marrow aspirate. Methods of medication. Disease Estimation

UNIT-3 (ZOO AND WILD ANIMAL MEDICINE)

Management and restraint of zoo and exotic animals. Drug delivery in zoo and wild animals. Visit to Zooor Sanctuary. Examination of veterolegal cases.

UNIT-4 (BACTERIAL, FUNGAL AND RICKETTSIAL DISEASES)

PRACTICALS

TB, JD and Mallein testing in animal. Brucellosis testing in animals. Physical and chemical tests for detection of mastitis. Application of molecular and serology techniques on clinical samples for disease diagnosis. Pen-side diagnostic tests for infectious diseases. Practical approaches to disease outbreak investigation and its control.

UNIT-5 (VIRAL AND PARASITIC DISEASES)

Collection and examination of skin scrapings- Parasitic, fungal, bacterial. Examination of blood for parasites. Dark field microscopy. Application of Molecular and serological techniques or clinical samples for diagnosis of viral and parasitic diseases.

ANNUAL EXAMINATION

PAPERS	UNITS	MAXIMUM MARKS	WEIGHTAGE
THEORY			
Paper-I	1, 2, 3 and 4	100	20
Paper-II	5, 6 and 7	100	20
PRACTICAL			
Paper-I	1, 2 and 3	60	20
Paper - II	4 and 5	60	20

(xvii) DEPARTMENT OF VETERINARY GYNAECOLOGY AND OBSTETRICS

VETERINARY GYNAECOLOGY AND OBSTETRICS

Credit Hours 2+1

THEORY

UNIT- 1 (VETERINARY GYNAECOLOGY)

Bovine : Applied clinical anatomy and embryology of female reproductive tract - Hereditary and congenital anomalies of female reproductive tract –Puberty and sexual maturity and their endocrine control- Delayed puberty- Its causes, clinical

approach, treatment and prevention of delayed puberty- Applied reproductive physiology and endocrinology of oestrous cycle- Oestrous cycle and factors affecting the length of the oestrous cycle-Aberrations of oestrus and their clinical management and problems in oestrus detection and oestrus detection aids –Transportation and survivability of gametes in female reproductive tract-Follicular Dynamics and its clinical impact on fertility improvement- ovulation and aberrations of ovulation-Incidence causes, diagnosis treatment and prevention of ovulatory failures- Fertilization and aberrations of fertilization- Fertilization failures - embryonic mortality-incidence, causes, diagnosis, treatment and prevention – Pathological affections of ovary, uterine tubes, uterus, cervix , vagina and external genitalia – Clinical management of specific and non-specific forms of infectious infertility- Role of nutrition, climate and stress on reproductive efficiency - Managemental causes of infertility- Anoestrus and repeat breeding syndrome - Diagnostic procedures in infertility investigation – Clinical uses of hormones and drugs in the management of infertility- Surgical procedures for correction of abnormalities of the female reproductive tract. Herd reproductive health management and fertility parameters in individual animals and in herds.

Assisted reproductive techniques: Synchronization of estrus and ovulation and its principle. methodology and implications- Multiple ovulation and Embryo transfer technology-In vitro fertilization.

Equines: oestrous cycle- Seasonality- breeding management- Aberrations of oestrous cycle and ovulations- Techniques of Pregnancy diagnosis- Clinical management of specific and non-specific forms of infectious infertility- Diagnostic procedures in infertility investigation

Ovines and caprines: oestrous cycle- Seasonality- Control of oestrous cycle and infertility

Swines : oestrous cycle- breeding management- Techniques of Pregnancy diagnosis and infertility

Canines and Felines : oestrous cycle- breeding management- Phantom pregnancy- Medical termination of pregnancy – Aberrations of oestrous cycle- Medical and surgical management of affections of ovary, uterine tubes, uterus, cervix, vagina and external genitalia – Methods of Population control by medical and surgical techniques. Comparative reproductive events in camel

Principle, procedure and application of ultrasonography in farm and pet animal reproduction

UNIT-2 (VETERINARY OBSTETRICS)

Farm and pet animals - Maternal recognition of pregnancy – Applied Endocrinology of pregnancy – Pregnancy diagnosis- Duration of pregnancy -Factors affecting gestation length- Care and management of pregnant animals- Implantation, Placentation- Classification, functions –Wandering of ovum- Telegony- Superfetation and Superfecundation – Clinical management of specific and non specific causes of abortion, extra uterine pregnancy, dropsy of fetal membranes and fetus, mummification, maceration, cervicovaginal prolapse, uterine torsion and hysterocele. Parturition- Signs of approaching parturition - Stages of parturition - Initiation and induction of parturition - lactational disorders - Puerparium and factors affecting puerparium - Postpartum care of the dam and neonate in different species of farm and pet animals - Dystocia – Classification - Clinical signs and diagnosis - Handling of Fetal and maternal dystocia – Obstetrical interventions - Mutation – Forced extraction – Fetotomy – Cesarean section in small and large animals – Maternal obstetrical paralysis - Retention of fetal membranes, Total uterine prolapse and common metabolic diseases of puerperal period – Post partum hemorrhage – Sub involution of placental sites - Injuries incidental to parturition - Post partum uterine infections – Post partum resumption of ovarian activity .

UNIT-3(VETERINARY ANDROLOGY AND A.I.)

Farm and pet animals - Comparative clinical reproductive anatomy and endocrinology of the male reproduction - Common congenital and genetic defects of the male reproductive tract – Puberty and sexual maturity and factors affecting them - Sexual behaviour and libido - Sperm transport, erection and ejaculation - Coital injuries and vices in male animals - Semen and ejaculate – Semen collection techniques- Structure of Spermatozoa - Semen evaluation - Semen extenders, dilution, preservation and post thaw evaluation - Artificial insemination techniques in farm and pet animals - Forms of male infertility - Impotentia coeundi and impotentia generandi – Affections of the scrotum, testis, accessory sex glands, penis and prepuce - Breeding soundness evaluation of bull – *In vitro* tests for evaluation of male fertility - Medical and surgical techniques for population control of the male reproduction – Surgical procedure on the male reproductive tract in farm and pet animals.

PRACTICAL

UNIT- 1 (VETERINARY GYNAECOLOGY)

Study of female genital organs using slaughter house specimens- Oestrus detection aids - Techniques of rectal palpation of female reproductive tract - Gynaecological equipment and instruments -Vaginal exfoliative cytology and vaginoscopy- Ultrasonography of female reproductive tract - Surgical procedures on the vulva, vagina and uterus-Study of pathological specimens of female genital tract- Demonstration and practice of ovario-hysterectomy and panhysterectomy- Diagnostic procedures in investigation of infertility in female animals

UNIT-2 (VETERINARY OBSTETRICS)

Study of pelvis and pelvimetry- Pregnancy diagnosis-Study of foetal membranes of domestic and pet animals -and identification of normal and abnormal foetal membranes-Approaching signs of parturition- Stages of parturition- Approach to an obstetrical case- Obstetrical anaesthesia - obstetrical instrument and equipment - Manipulation of foetal malpresentation in phantom boxes - Maternal causes of dystocia and its management-Fetotomy in cadavers, Demonstration of forceps delivery and Caesarean section in small and large animal clinical cases. Handling of prolapse of genitalia.

UNIT-3 (VETERINARY ANDROLOGY, AI AND ASSISTED REPRODUCTIVE TECHNIQUES)

Study of male genital organs using slaughter house specimens- Techniques of rectal palpation of the male reproductive tract- Andrological and AI equipment -Vasectomy and castration -Surgical procedures on penis, prepuce and scrotum- Planning and organization of AI centre-Preparation of teaser animals -Selection, care, training and maintenance of male animal used for breeding purpose-Techniques of semen collection-Semen evaluation techniques -Sterilization, storage of equipment used for semen collection and Artificial insemination-Preparation of extenders and extension of semen-Preservation of semen-Thawing of semen and technique of AI-Handling and maintenance of LN₂ containers. Diagnostic procedures in investigation of infertility in male animals-Breeding soundness evaluation of bulls- Oestrus synchronization procedures- Multiple Ovulation and Embryo Transfer- *In Vitro* Fertilization

ANNUAL EXAMINATION

PAPERS	UNITS	MAXIMUM MARKS	WEIGHTAGE
THEORY			
Paper-I	1	100	20
Paper-II	2 and 3	100	20
PRACTICAL			
Paper-I	1	60	20
Paper - II	2 and 3	60	20

PART VI**MINIMUM STANDARDS OF VETERINARY EDUCATION**

22. (1) The following are the minimum standard requirements for a Veterinary College for 80 Admissions Annually, namely:-

Each Veterinary College shall have the following Seventeen Departments under the administrative control of the Dean or Principal or Associate Dean. Poultry Science or Wild animal or any other department if existing, as per their regional importance in that area, shall continue to exist with minimum of three teachers with atleast one professor, namely:-

- (i) Veterinary Anatomy
- (ii) Veterinary Physiology and Biochemistry
- (iii) Livestock Production Management
- (iv) Veterinary Microbiology
- (v) Veterinary Pathology
- (vi) Animal Genetics and Breeding
- (vii) Animal Nutrition
- (viii) Veterinary Pharmacology and Toxicology
- (ix) Veterinary Public Health and Epidemiology
- (x) Veterinary Parasitology
- (xi) Livestock Product Technology
- (xii) Veterinary and Animal Husbandry Extension Education

ANNUAL EXAMINATION			
PAPERS	UNITS	MAXIMUM MARKS	WEIGHTAGE
THEORY			
Paper-I	1, 2, 3, 4 and 5	100	20
Paper-II	6, 7, 8, and 9	100	20
PRACTICAL			
Paper-I	1	60	20
Paper - II	2	60	20

(xiii) **VETERINARY CLINICAL COMPLEX (VCC)****VETERINARY CLINICAL PRACTICES-I (Third year)****Credit Hours: 0+1**

Orientation and understanding the working of Veterinary Clinics including hospital set up, administration and work force management. Doctor client interaction, Orientation to local language or dialect or local terminology of the diseases. Registration, filling up registration cards, history taking, handling and restraining of animals. Preliminary clinical examination such as recording of temperature, respiration, pulse, motility of digestive system etc. Familiarization and practice of first aid procedures. Practice of collection, labeling, packaging and storage of laboratory samples. Preparation and sterilization of surgical packs, instruments, drapes and operation theaters. Familiarisation with antiseptic dressing techniques and bandaging.

VETERINARY CLINICAL PRACTICES-II**(Fourth year)****Credit Hours: 0+6**

The students shall be imparted the trainings on rotation basis in the following sections of Veterinary Clinical Complex (VCC):

Ambulatory Section:

Each Veterinary college should adopt five villages where in the health, production and treatment part should be taken care of in a holistic manner.

Handling, examination, diagnosis and treatment of sick animals in the field conditions under the supervision of faculty. Ambulatory Clinics shall be operated by small groups of students and faculty of clinical departments through an equipped ambulatory mobile unit.

Diagnostic Laboratory Section:

Veterinary Clinical Diagnostic Laboratory will be an important component of Teaching Veterinary Clinical Complex that will impart training to students for laboratory evaluation and interpretation of clinical samples leading to definitive diagnosis of diseases. This activity will improve competence of students in examining clinical samples (biochemical, toxicological, pathological, parasitological and bacteriological) at the clinical complex, analyzing and correlating with clinical findings and interpreting the results. Collection labeling, transportation, and preservation of body fluid samples, writing results and report. Interpretation of data in relation to specific diseases. Clinical significance and interpretation of serum glucose, lipids, proteins, blood urea nitrogen, creatinine, uric acid, ketone bodies, bilirubin and electrolytes from samples. Clinical significance and interpretation of examination of urine samples. Clinical evaluation of blood (Haemoglobin, packed cell volume, total erythrocytic count, erythrocytic sedimentation rate, total leukocytic count and differential leukocytic count) from clinical samples. Evaluation of acid-base balance and interpretation. Biochemical aspects of digestive disorders, endocrine functions. Liver, kidney and pancreatic function tests. Role of enzymes for detection of tissue or organ affection. Preparation of microscopic slides from tissue collected for diagnosis and its histopathological interpretation. Examination of biopsy and morbid material for laboratory diagnosis. Laboratory evaluation and diagnosis of samples for parasitic diseases (routine faecal examinations- direct smear method, simple sedimentation and floatation methods, quantitative faecal examination, pastural larval counts). Examination of skin scrapings, examination of blood. Orientation to a clinical Microbiology laboratory, collection, transport and processing of specimens from clinical cases for diagnosis of important bacterial, fungal and viral diseases. Isolation of bacteria from clinical samples, identification of bacteria by Grams staining and cultural or biochemical characteristics. Drug sensitivity and rationale for therapy. Diagnosis of diseases by employing tests like Agar Gel precipitation Test, ELISA etc.

Note: The Laboratory shall run in collaboration with the Department of Pathology and Physiology and Biochemistry. Biochemist appointed in this section will be involved in teaching of students regarding principles of various diagnostic tests, normal and abnormal values in different species, differential diagnosis, correlating with diseases and rationale of arriving at the conclusion.