VETERINARY GYNAECOLOGY & OBSTETRICS

Course Structure

COURSE NO.	COURSE TITLE	CREDITS	SEM
VOG 601	GENERAL GYNAECOLOGY	3+1	I
VOG 602	FEMALE INFERTILITY	3+1	II
VOG 603	VETERINARY OBSTETRICS	2+2	I
VOG 604	ANDROLOGY & MALE INFERTILITY	3+1	II
VOG 605	SEMEN PRESERVATION AND ARTIFICIAL INSEMINATION	2+1	I
VOG 606	REPRODUCTIVE BIOTECHNOLOGY	2+1	II
VOG 607	CLINICAL PRACTICE I	0+3	I
VOG 608	CLINICAL PRACTICE II	0+3	II
VOG 691	MASTER'S SEMINAR	1	I, II
VOG 699	MASTER'S RESEARCH	20	I, II
VOG 701	ADVANCES IN GYNAECOLOGY	2+1	I
VOG 702	ADVANCES IN OBSTETRICS	2+1	II
VOG 703	ADVANCES IN ANDROLOGY	2+1	I
VOG 704	ADVANCES IN REPRODUCTIVE BIOTECHNOLOGY	1+1	II
VOG 705	ADVANCES IN SEMEN PRESERVATION	1+1	I
VOG 706	CLINICAL PRACTICE I	0+3	I
VOG 707	CLINICAL PRACTICE II	0+3	II
VOG 790	SPECIAL PROBLEM	0+2	I, II
VOG 791	DOCTORAL SEMINAR I	1	I, II
VOG 792	DOCTORAL SEMINAR II	1	I, II
VOG 799	DOCTORAL RESEARCH	45	I, II

VETERINARY GYNAECOLOGY & OBSTETRICS

Course Contents

VOG 601 GENERAL GYNAECOLOGY 3+1 SEM - I

Objective

To understand hormonal regulation of female reproduction and therapeutic management of infertility.

Theory

UNIT-I: Puberty and sexual maturity, role of hypothalamic-pituitary-gonadal axis in attainment of puberty and sexual maturity, onset of postpartum ovarian activity, Endocrine regulation of estrous cycle.

UNIT-II: Folliculogenesis, oogenesis and ovulation and associated endocrine pattern, manipulation of follicular waves, synchronization of estrus and ovulation and induction of ovarian activity.

UNIT-III: Gamete transport, fertilization, implantation and maternal recognition of pregnancy.

UNIT-IV: Embryonic and fetal development, placentation, fetal circulation and gestation, position of fetus in the uterus, age characteristics of fetus.

UNIT-V: Pregnancy diagnosis: clinical, ultrasonographic, endocrinological and other diagnostic laboratory tests. Pseudo-pregnancy and its treatment.

UNIT-VI: Factors affecting reproduction – seasonality, nutrition, stress, environment, management, suckling and diseases.

UNIT-VII Lactation and artificial induction of lactation.

Practical

Clinical examination of female genitalia. Biometry of female genital organs. Rectal and vaginal examination to diagnose cyclic phases of estrous cycle. Fern pattern of cervical mucus and exfoliated vaginal cytology. Pregnancy diagnosis in large and small animals by various methods. Estimation of age of the fetus. Use of ultrasound / RIA / ELISA in gynaecology. Synchronization of estrus and ovulation in farm animals.

Suggested Readings

Cupps PT. 1991. *Reproduction in Domestic Animals*. Academic Press.

Hafez ESE. 2000. *Reproduction in Farm Animals*. Lippincott, Williams & Wilkins.

Noakes DE, Parkinson DJ & England GCW. 2001. *Arthurs Veterinary Reproduction and Obstetrics*. Saunders Harcourt India.

Pubedam MH & Pubedam MH. 2003. *McDonald's Veterinary Endocrinology and Reproduction*. Iowa State Press.

Roberts SJ. 1976. *Veterinary Obstetrics and Genital Diseases*. Scientific Book Agency.

VOG 602 FEMALE INFERTILITY 3+1 SEM - II

Objective

To impart knowledge and training in diagnosis and treatment of infertility in female domestic animals.

Theory

UNIT-I: Introduction to infertility, classification, economic impact. Anatomical causes of infertility, congenital and hereditary causes and acquired defects.

UNIT-II: Nutritional causes of infertility. Importance of body condition score.

UNIT-III: Managemental and environmental causes of infertility. Out of season breeding.

UNIT-IV: Infectious causes of female infertility, specific and non-specific infections.

UNIT-V: Ovarian dysfunction: anoestrus, cystic ovarian degeneration, anovulation, delayed ovulation and luteal insufficiency.

UNIT-VI: Repeat breeding: its causes, diagnosis and treatment.

UNIT-VII: Early embryonic death (EED): causes, diagnosis and therapeutic management.

UNIT-VIII: Abortion: infectious and non-infectious causes, diagnosis and prevention of abortion.

UNIT-IX: Interactions in Immunological mechanisms and infertility.

Practical

Record keeping, herd fertility assessment and management, diagnosis and treatment of infertility in female animals, use of uterine swabs for bacterial and fungal culture, histo-pathological evaluation of uterine biopsy, exfoliated vaginal cytology and hormone assay.

Use of ultrasonography in diagnosis of infertility. Immuno diagnostic techniques.

Suggested Readings

Laing JA. 1979. *Fertility and Infertility in Domestic Animals*. English Language Book Soc. & Bailliere Tindall.

Morrow DA. 1986. *Current Therapy in Theriogenology*. WB Saunders.

Noakes DE, Parkinson DJ & England GCW. 2001. *Arthurs Veterinary Reproduction and Obstetrics*. Saunders Harcourt India.

Roberts SJ. 1976. *Veterinary Obstetrics and Genital Diseases*. Scientific Book Agency.

VOG 603 VETERINARY OBSTETRICS 2+2 SEM - I

Objective

To impart knowledge and training on problems of pregnancy and parturition and their management in domestic animals.

Theory

UNIT-I: Parturition: stages of parturition, mechanism of initiation of parturition, hormonal profiles associated with parturition.

UNIT-II: Principles of handling of dystocia, obstetrical procedures: mutations, fetotomy, caesarean section. Obstetrical anesthesia and analgesia, epidural anesthesia.

UNIT-III: Fetal and maternal dystocia: causes, diagnosis and management.

UNIT-IV: Uterine torsion: causes, diagnosis and its correction.

UNIT-V: Diseases and accidents during gestation and around parturition.

UNIT-VI: Etiology, diagnosis and treatment of ante-partum and post-partum uterine and vaginal prolapse.

UNIT-VII: Induction of parturition and elective termination of pregnancy.

UNIT-VIII: Involution of uterus following normal and abnormal parturition.

UNIT-IX: Care of dam and the newborn.

Practical

Pelvimetory of different species of farm animals. Diagnosis and correction of abnormal fetal presentation, position and posture in phantom box. Epidural anethesia, ovariohysterectomy and caesarean operation. Fetotomy exercises. Detorsion of uterus. Management of prolapse. Handling of clinical cases of dystocia.

Suggested Readings

Arthur GH, Pearson H & Noakes DE. 2000. *Veterinary Reproduction and Obstetrics*. English Languge Book Society & Bailliere Tindall.

Roberts SJ. 1976. *Veterinary Obstetrics and Genital Diseases*. Scientific Book Agency.

Sloss V & Dufty JH. 1980. *Handbook of Bovine Obstetrics*. Williams & Wilkins.

VOG 604 ANDROLOGY AND MALE INFERTILITY 3+1 SEM - II

Objective

To impart knowledge and training about male reproduction and treatment of male infertility in domestic animals.

Theory

UNIT-I: Structure and function of reproductive tract of male.

UNIT-II: Sexual behavior and examination of bulls for breeding soundness.

UNIT-III: Spermatogenesis, (formation, migration, maturation and ejaculation of semen), fine structure of spermatozoa, semen and its composition.

UNIT-IV: Diseases transmitted through semen.

UNIT-V: Factors affecting semen quality, semen culture, tests for assessment of sperm motility, sperm survival and fertilizing capacity of spermatozoa.

UNIT-VI: Causes of infertility: hereditary, congenital, infectious, nutritional and hormonal. Pathological and functional disturbances of epididymis, vas deferens and accessory sex glands.

UNIT-VII: Impotentia cocundi and impotentia generandi. Testicular hypoplasia and degeneration: causes and affect on semen and fertility.

UNIT-VIII: Coital injuries and vices of male animals.

Practical

General and rectal examination for biometrics of male genitalia and accessory sex glands. Breeding soundness evaluation of male animals. Semen evaluation for sperm abnormalities, fertility and determination of other biochemical constituents of seminal plasma. Computer assisted semen analysis (CASA), Microbiological load of semen.

Examination, diagnosis and treatment of infertile male animals.

Suggested Readings

Hafez ESE. 2000. *Reproduction in Farm Animals*. Lippincott, Williams & Wilkins.

Mann T & Lutwak-Mann C. 1981. *Male Reproductive Function and Semen*. Springer-Verlag.

Morrow DA. 1986. *Current Therapy in Theriogenology*. WB Saunders.

Roberts SJ. 1976. *Veterinary Obstetrics and Genital Diseases*. Scientific Book Agency.

Salisbury GW, VanDemark NL & Lodge JR. 1978. *Physiology of Reproduction and Artificial Insemination of Cattle*. WH Freeman & Co.

VOG 605 SEMEN PRESERVATION AND ARTIFICIAL INSEMINATION 2+1 SEM - I

Objective

To impart knowledge and training about collection, evaluation and preservation of semen and artificial insemination (AI) in domestic animals.

Theory

UNIT-I: History of artificial insemination.

UNIT-II: Methods of semen collection.

UNIT-III: Semen evaluation: macroscopic, microscopic, biochemical and microbiological tests, Computer assisted semen analysis (CASA).

UNIT-IV: Semen preservation. Extenders for preservation of semen at different temperatures. Semen additives for enhancement of motility and fertilizing capacity of spermatozoa.

UNIT-V: Cryopreservation of semen. Effects of cryopreservation on spermatozoa, semen quality and fertility.

UNIT-VI: Thawing protocols of frozen semen. Factors affecting post-thaw semen quality.

UNIT-VII: Ideal protocol for AI in different species of animals. Factors affecting success of AI.

Practical

Computer assisted semen analysis (CASA), Collection and evaluation of semen. Preparation of extenders. Preservation of semen: room temperature, refrigeration and cryopreservation. Handling and evaluation of processed semen. Practice of AI techniques.

Suggested Readings

Hafez ESE. 2000. *Reproduction in Farm Animals*. Lippincott, Williams & Wilkins.

Perry J. 1970. *Artificial Insemination of Farm Animals*. Oxford & IBH.

Salisbury GW, VanDemark NL & Lodge JR. 1978. *Physiology of Reproduction and Artificial Insemination of Cattle*. WH Freeman.

VOG 606 REPRODUCTIVE BIOTECHNOLOGY 2+1 SEM - II

Objective

To impart knowledge and training on biotechniques in animal reproduction.

Theory

UNIT-I: Embryo transfer technology: selection of donors and recipients.

UNIT-II: Synchronization, super-ovulation, surgical and non-surgical collection of embryos and evaluation of embryos.

UNIT-III: Cryopreservation of embryos, transfer of embryos to donors.

UNIT-IV: *In vitro* fertilization, *in vitro* maturation, micromanipulation of embryos.

UNIT-V: Sexing of sperm and embryos.

UNIT-VI: Transgenic animals. Chimeras.

UNIT-VII: Stem cell biotechnology

UNIT-VIII: Immuno-neutralization of hormones. Immunomodulation of fertility.

Practical

Synchronization of estrus in donors and recipients, superovulation, surgical and non-surgical collection and transfer of embryos. Collection of oocytes from slaughter house genitalia. *In vitro* fertilization, *in vitro* maturation and cryopreservation of embryos. Sexing of embryos.

Suggested Readings

Gordon I. 2004. *Reproductive Technologies in Farm Animals*. CABI.

Hafez ESE. 2000. *Reproduction in Farm Animals*. Lippincott, Williams & Wilkins.

VOG 607 CLINICAL PRACTICE – I 0+3 SEM - I

Objective

Hands-on training on diagnosis and treatment of reproductive disorders in animals in TVCC.

Practical

Clinical examination of animals affected with reproductive disorders, use of diagnostic techniques for diagnosis and institution of required therapy. Maintenance of case records. Presentation on selected /assigned cases.

Suggested Readings

Morrow DA. 1986. *Current Therapy in Theriogenology*. WB Saunders.

VOG 608 CLINICAL PRACTICE – II 0+3 SEM - II

Objective

Hands-on training on diagnosis and treatment of reproductive disorders in animals in TVCC.

Practical

Clinical examination of animals affected with reproductive disorders, use of diagnostic techniques for diagnosis and institution of required therapy. Maintenance of case records. Presentation on selected /assigned cases.

Suggested Readings

Morrow DA. 1986. *Current Therapy in Theriogenology*. WB Saunders.

VOG 701 ADVANCES IN GYNAECOLOGY 2+1 SEM - I

Objective

To learn about advances in endocrine, ovarian and uterine functions and effect of nutrition, season and immunological factors on female fertility.

Theory

UNIT-I: Neuro-endocrine control of reproduction, follicular development, ovulation fertilization and implantation. Embryonic and fetal development.

UNIT-II: Maternal recognition of pregnancy, Advances in early diagnosis of pregnancy.

UNIT-III: Embryonic losses, abortion and their prevention.

UNIT-IV: Seasonal breeders, synchronization and induction of estrus and ovulation in seasonal breeders, Assisted reproductive technology (ART) to increase reproductive efficiency in farm animals..

UNIT-V: Effect of stress, nutrition and immunological factors on fertility.

UNIT-VI: Onset of postpartum ovarian activity and factors affecting it.

UNIT-VII: Diagnostic & therapeutic approaches in infertility: Principles of hormone therapy in reproductive disorders, Laproscopy, ultrasonographic diagnosis of ovarian/uterine dysfunction, RIA/ELISA techniques for hormones assay in reproductive disorders, vaginal and uterine cytology

Practical

Clinical examination of female animals. Use of ultrasonography in ovarian function (follicular image pattern, follicular dynamics) and in early pregnancy diagnosis and infertility. Utility of uterine culture, uterine cytology and uterine biopsy (histopathological examination) in infertility investigation. Laparoscopy in diagnosis of ovarian and uterine dysfunction. ELISA/RIA of hormones and interpretation of results. Use of Assisted reproductive technology (ART) to enhance reproductive efficiency in farm animals.

Suggested Readings

Selected articles from journals.

VOG 702 ADVANCES IN OBSTETRICS 2+1 SEM - II

Objective

To learn current developments in diagnosis and management of dystocia, accidents of gestation and peri-parturient disorders in domestic animals.

Theory

UNIT-I: Conceptus and its development. Factors influencing gestation period and birth weight.

UNIT-II: Anomalies of conceptus, teratogens and effect of stress on conceptus development.

UNIT-III: Mechanism of initiation of parturition. Use of tocolytic drugs in management of

uterine inertia.

UNIT-IV: Induction of parturition and termination of abnormal pregnancies. Obstetrical analgesia and anaesthesia.

UNIT-V: Pre-treatment evaluation of the dam suffering from dystocia. Management of maternal and fetal dystocia, hydrallantois, hydramnion, fetal mummification, fetal maceration, uterine inertia and uterine torsion.

UNIT-VI: Fetotomy, caesarean section and ovairo-hysterectomy.

UNIT-VII: Neo-natal physiology and post-natal adaptations.

UNIT-VIII: Involution of uterus, post-partum ovarian dysfunction and their manipulation.

Practical

Obstetrical operations in fetal dystocia: Mutations, fetotomy, caesarean section, ovario-hysterectomy; induction of parturition, use of tocolytic drugs in dystocia, obstetrical analgesia and anaesthesia.

Suggested Readings

Selected articles from journals.

VOG 703 ADVANCES IN ANDROLOGY 2+1 SEM - I

Objective

To learn advances in male reproduction and treatment of male infertility in domestic animals

Theory

UNIT-I: Spermatogenesis, spermatogenic waves, sperm passage in male genitalia, biochemical milieu of male genetalia. Correlation between motility and fertilizing capacity of spermatozoa.

UNIT-II: Separation of motile and immotile spermatozoa. Sexing and separation of male and female determining spermatozoa.

UNIT-III: Sperm plasma membrane and its permeability and binding properties: acrosome and lysosomal enzymes, sperm nucleus and nuclear proteins. Mitochondria and their role in sperm metabolism. Flagellum and the mechanochemical basis of motility and cyclic nucleotides.

UNIT-IV: Biochemistry of seminal plasma and accessory sex gland secretions. Electrolytes, proteins, enzymes and amino acids in seminal plasma. Fructose and other sugars, lipids, cholesterol, steroid hormones and prostaglandins in seminal plasma.

UNIT-V: Fructolysis index. Aerobic and anaerobic metabolism of spermatozoa.

UNIT-VI: Biochemical markers of fertility in males, sperm chromatin structure assay, Anti-sperm antibodies.

Practical

Breeding soundness evaluation of bulls, biochemical tests of semen for evaluation of fertility, semen culture for diagnosis of venereal diseases, diagnosis and treatment of genital pathological condition. Computer assisted semen analysis (CASA), Semen evaluation for assessment of fertilizing capacity of spermatozoa: cervical mucus penetration test, sperm capacitation test, hypo osmotic swelling test and zona free hamster egg penetration test. Anti-sperm antibody assay.

Suggested Readings

Selected articles from journals.

VOG 704 ADVANCES IN REPRODUCTIVE BIOTECHNOLOGY 1+1 SEM - II

Objective

To learn advances in recent developments in biotechnology in reproduction for the production of desired elite animals.

Theory

UNIT-I: Embryo transfer technology and its application in farm animals.

UNIT-II: Selection and management of donor and recipient animals. Superovulation, surgical and non-surgical collection, evaluation of embryos and transfer of embryos.

UNIT-III: *In vitro* fertilization and maturation of oocytes.

UNIT-IV: Micromanipulation, sexing and cryopreservation of embryos.

UNIT-V: Sexing of sperm and embryos.

UNIT-VI: Transgenic animals. Chimeras.

UNIT-VII: Stem cell biotechnology

UNIT-VIII: Immuno-neutralization of hormones. Immunomodulation of fertility.

Practical

Evaluation of superovulatory hormonal regimens in donors and synchronization of estrus in recipients. Surgical and non-surgical collection and transfer of embryos. Collection of oocytes from slaughter house genitalia. *In vitro* fertilization, *in vitro* maturation and cryopreservation of embryos. Sexing of embryos.

Suggested Readings

Selected articles from journals.

VOG 705 ADVANCES IN SEMEN PRESERVATION 1+1 SEM - I

Objective

To learn advances in processing and cryopreservation of semen and insemination techniques to obtain high fertility.

Theory

UNIT-I: Transmission of venereal diseases through semen and their prevention.

UNIT-II: Factors affecting motility and fertilizing capacity of spermatozoa. Semen collection, extension and cryopreservation of semen, damages to spermatozoa caused by cryopreservation.

UNIT-III: Use of semen additives for promotion of sperm motility and fertilizing capacity.

UNIT-IV: Thawing protocols for frozen semen. Post-thaw evaluation of motility and fertilizing capacity of spermatozoa.

Practical

Collection of preputial washings and semen for bacterial load and venereal pathogens. Preparation of semen extenders with different additives. Use of different freezing protocols for preservation of semen. Evaluation of fertility with frozen semen. Enzymatic changes in semen following cryopreservation.

Suggested Readings

Selected articles from journals.

VOG 706 CLINICAL PRACTICE – I 0+3 SEM - I

Objective

Hands-on training on diagnosis and treatment of reproductive disorders in animals.

Practical

Clinical examination of animals affected with reproductive disorders, use of diagnostic techniques for diagnosis and institution of required therapy, maintenance of case records, presentation on selected/ assigned cases.

Suggested Readings

Selected articles from journals.

VOG 707 CLINICAL PRACTICE – II 0+3 SEM - II

Objective

Hands-on training on diagnosis and treatment of reproductive disorders in animals.

Practical

Clinical examination of animals affected with reproductive disorders, use of diagnostic techniques for diagnosis and institution of required therapy.

Suggested Readings

Selected articles from journals.

VOG 790 SPECIAL PROBLEM 0+2 SEM - I, II

Objective

To expose students to research techniques related to sub discipline of the subject and submission of written project with references.

Practical

Student will carry out research on allotted project and submit the project along with research papers for publication in scientific journals.

VETERINARY GYNAECOLOGY & OBSTETRICS

List of Journals

- American Journal of Obstetrics and Gynaecology
- Animal Reproduction
- Animal Reproduction Science
- Animal Science Journal
- Bibliography of Reproduction
- Biology of Reproduction
- Equine practice
- Equine Veterinary Journal
- Fertility and Sterility
- Indian Journal of Animal Reproduction
- Indian Journal of Animal Sciences
- Indian Journal of Experimental Biology
- Indian Veterinary Journal
- Journal of American Veterinary Medical Association
- Journal of Animal Science
- Journal of Dairy Science
- Journal of Endocrinology
- Journal of Reproduction and Development
- Journal of Reproduction and fertility
- Reproduction in Domestic Animals
- Research in Veterinary Science
- Theriogenology
- Veterinary Record

e-Resources

- www.anirgyep.elsevier.com (Animal Reproduction Science)
- www.blackwellpublilshing.com (International Journal of Andrology)
- www.bioreprod.org (Biology of reproduction)
- www.domesticanimalendo.com (Domestic Animal Andocrinology)
- www.reproduction-onlline.org (Journal of Andrology)
- www.reproduction-online.org (Reproduction)
- www.interscience.wiley.com (Reproduction in domestic animals)
- www.theriojournal.com (Theriogenology)
- www.buffaloresearch.com (Buffalo Journal)
- www.eje-online.org (European journal of Endocrinology)
- www.sciencedirect.com (The Veterinary Journal)
- www.blackwellpublishing.com (Asian journal of Andrology)
- www.editorijar@yahoo.co.in (Indian Journal of Animal Reproduction)

Suggested Broad Topics for M aster's and Doctoral Research

- Anoestrus: Endocrinological investigations
- Reproductive biotechnology
- Investigations into andrological problems
- Management of obstetrical problems