

LPUNEST (Ph.D.) Syllabus

(Ph.D. Clinical embryology)

Unit 1

Concept of fertilization: Site of fertilization, contact and fusion of gametes, zygote formation, structural changes from zygote to blastocyst, implantation

Physiology of placenta and pregnancy: Hormones, fetoplacental unit, physiology of pregnancy, test for pregnancy, physiology of labour and lactation.

Unit 2

Female Infertility: Diagnosis and management of tubal factor infertility, categories of tubal disease, techniques for identifying tubal infertility, uterine fertility: congenital vs. acquired, menstrual disorders, pregnancy disorders (pre-eclampsia, IUGR, labor abnormalities)

Cancers and biomarkers: ovarian, endometrial, and cervical

Unit 3

Male Infertility: Genetic basis of male infertility, impact of paternal factors on embryo quality and development, role of the acrosome index in fertilization prediction, disorders at the testicular level

Cancers and biomarkers: testicular and prostate

unit 4

Semen analysis: Semen analysis as per WHO guidelines, sperm function test, sperm processing techniques (direct overlay, swim up, density gradient, microfluidics, magnetic-activated cell sorting), sperm banks, sperm retrieval procedures [percutaneous epididymal sperm aspiration (PESA)/microsurgical epididymal sperm aspiration (MESA), testicular sperm aspiration (TESA)/testicular sperm extraction (TESE)].

Unit 5

Assisted reproductive techniques & recent advances I: Ovulation induction, oocyte retrieval, in-vitro maturation, in-vitro fertilization, gamete intra-fallopian transfer (GIFT), zygote intra-fallopian transfer (ZIFT), oocyte and embryo donation, surrogacy and gestational carriers, intrauterine insemination (IUI), micromanipulation techniques (ZPD, ICSI, IMSI, PICSI, SUZI)

Unit 6

Assisted reproductive techniques & recent advances II: Agonist and antagonist protocols, stimulation protocols, individualized protocols, complications of assisted reproduction, ovarian hyperstimulation syndrome (OHSS), multiple pregnancy & complications, fertility drugs and ovarian cancer, ectopic pregnancy.