Programme: M. Sc. (Zoology)
Course Code: ZOO-405 **Title of the Course:** Human Genetics
Number of Credits: 2
Effective from AY: 2018-19

Prerequisites for the course:	Basic working knowledge of classical genetics.	
Objective:	This course develops concepts of Human Genetics and its use in the diagnosis of genetic disorders. This will also help in eugenics by genetic counselling.	
Content:	**Module 1:** Basic principles of genetics, human genetic make-up, genes as submicroscopic factors controlling human traits, packing of DNA/chromatin into chromosomes, nuleosomes and histones. Human chromosome structure, Sex determination in man, Sex chromatin, Lyon hypothesis**,** Human karyotype, banding techniques, chromosome identification and nomenclature (ISCN)**.** Principles of inheritance in man (autosomal / sex linked / dominant / recessive); human pedigree analysis**,** Human genetic disorders, chromosomal (structural and numerical; autosomal or X linked) and biochemical (inborn errors of metabolism) with examples, Eugenics and genetic counseling **Module 2:** Prenatal diagnosis of genetic disorders, cytogenetic, biochemical and ultrasonography techniques, amniocentesis, chorionic villus sampling, cordocentesis**,** Biochemical markers for prenatal diagnosis, triple test for Down's syndrome. Dermatoglyphics and its application in the diagnosis of human genetic disorders**,** Principles of FISH, RFLP & DNA finger printing and their uses in human genetics.	12 hours 12 hours
Pedagogy:	Lectures/ tutorials/assignments/self-study	
References/Readings	1. Cummings ML, Human Genetics, CENGAGE Learning, Stamford. 2. Kothari ML, Mehta LA and Roychoudhury SS, Essentials of Human Genetics, Oxford University Press, India. 3. Hoelzel AR, Molecular Genetic Analysis of Populations ,Oxford University Press, India. 4. Gersen SL and Keagle MB, The Principles of Clinical Cytogenetics, Humana Press, Totowa, New Jersey 5. Turnpenny P and Ellard S, Emery's Elements of Medical Genetics, Elsevier, UK	
Learning Outcomes	1. Knowledge of genetic variability in human population 2. Knowledge of human genetics 3. Knowledge of modern methods for clinical genetic diagnosis 4. Knowledge of the genetic basis of common types of hereditary diseases	