SEMESTER-VI
Bachelor of Science (Hons) Anthropology

DISCIPLINE SPECIFIC CORE COURSE -16 (DSC-16)
Human Population Genetics

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical / Practice		
Human Population Genetics	04	03	Nil	01	Class XII pass	NIL

(Teaching hours required: Theory, 45 hours; Practical, 30 hours)

Course Objectives

1. To understand the basic tenets of human population genetics
2. To learn the concepts of evolutionary forces and their applications
3. To understand the role of human genetic variation in shaping current population structure

Learning Outcomes

The students will be able to:

- develop basic understanding of genetic principles of human populations
- understand the concept of polymorphisms and its applications in understanding genetic structure of human populations
- develop an idea of different types of evolutionary forces
- understand the role of genetic variations in studying human populations

Syllabus:

Unit-1 (10 Hours)

Landmarks in the history of population genetics, Concept of genetic polymorphism; haplotypes and haplogroups; transient, balanced polymorphisms; single locus versus multi-locus inheritance and population structure

Unit-2 (11 Hours)

Genotypic and allelic frequencies, assumptions of Hardy-Weinberg equilibrium, and its applications

Unit-3 (12 Hours)

Concept of Mutation, Natural Selection, Genetic drift, Gene flow, admixture and inbreeding

Unit-4(12 Hours)

Models explaining the maintenance of genetic polymorphism (Relationship between sickle cell and malaria, X-linked polymorphism and selection relaxation hypothesis)

Practical (30 Hours)

1. Blood group typing-ABO; MN and Rh (D) blood groups
2. Color Blindness
3. Blood Collection, sample transportation
4. Plasma and RBC separation and storage in field

References

1. Vogel F. and Motulsky A.G. (1996). Human Genetics: Problems and Approaches. Springer, 3rd revised edition.
2. Cooper DN and Kehrer-Sawatzki H. (2008). Handbook of Human Molecular Evolution. John Wiley & Sons, volume-2.
3. Lewis R. (2009). Human Genetics: Concepts and Applications 9th Edition. The McGraw−Hill Companies, Inc.
4. Patch C. (2005). Applied Genetics in Healthcare. Taylor & Francis Group
5. Templeton A. R. (2018). Human Population Genetics and Genomics. Academic Press.

Teaching Learning Process

The process of learning will involve acquisition of domain knowledge and understanding of skills required for conducting research in human population genetics. Process will involve lectures, assignments, class-room discussions, laboratory experiments and appropriate inference of results and practical file preparation.

Assessment Methods

Theoretical understanding of the student will be assessed using time-constrained examination. The assessment of the practical will be based on the conducting the laboratory-based experiments, inference of results and practical file preparation.

Keywords

human genetics, DNA, genetic structure, human evolution, natural selection, genetic drift