

- Srivastava, V. K. Edited (2005). Methodology and Fieldwork. New Delhi: Qxford University Press.
- Patnaik, S. M. (2011). Culture. Identity and Development: An Account of Team Ethnography among the Bhil of Jhabua. Jaipur: Rawat Publications.

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### GENERIC ELECTIVES (GE-6)

#### 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
		Lecture	Tutorial	Practical/Practice		
Genetic Research in Anthropology	4	3	0	1	Class X II pass with biology	NIL

#### Learning Objectives

The Learning Objectives of this course are as follows:

1. To introduce human genetics through anthropological perspectives where impetus will be laid on building an understanding of biochemical and molecular markers and their relevance in anthropology.
2. The course focuses on application of anthropological genetics in mendelian populations and molecular basis of complex diseases.
3. The course also focuses on aspects of field work, data collection, ethical, legal and social issues in genetic research in anthropology.

#### Learning outcomes

The Learning Outcomes of this course are as follows:

1. The students will be trained to use biochemical markers with respect to disease profile.
2. The students can be better equipped to understand the importance of mendelian populations in genetic research that can be applied to disease genetics.
3. The students will be skilled with basic laboratory techniques for molecular markers.
4. The students will be better equipped to comprehend fieldwork and data collection along with an understanding of ethical and legal aspects of genetic research.

#### SYLLABUS OF GE-6

##### UNIT – I Basic concepts (9 hours)

History and relevance of genetic research in anthropology, evolution of genetic markers as a tool in human research, concept of Hardy-Weinberg Equilibrium principle.

##### UNIT – II Methods of genetic research in anthropology (9 hours)

Twin studies, genetic linkage studies, pedigree analysis, candidate gene studies, cohort studies, cross-sectional studies, hypothesis and technology driven research

### **UNIT – III Data collection in human genetic studies (9 hours)**

Field work and data collection strategies, quantitative and qualitative data collection in field

### **UNIT – IV Techniques in human genetics (9 hours)**

Agglutination, electrophoresis, PCR, sequencing techniques

### **Unit-V: Ethical, legal and social issues in genetic research (9 hours)**

Ethical guidelines and practices in genetic research, legal and social issues in genetic research, Indian national guidelines for collaborative research in genetics.

### **Practical component (if any) - (30 hours)**

1. ABO blood group
2. DNA extraction
3. Identification of genetic mutation through specific technique

### **Essential/recommended readings**

1. Speicher, M. R., Motulsky, A. G., & Antonarakis, S. E. (Eds.). (2010). Vogel and Motulsky's human genetics. Berlin, Heidelberg: Springer Berlin Heidelberg.
2. Crawford, M. H. (Ed.). (2007). Anthropological genetics: theory, methods and applications. Cambridge University Press.
3. Mange, E. J., & Mange, A. P. (1999). Basic human genetics. Sinauer Associates Inc., U.S.
4. Reich, D., Thangaraj, K., Patterson, N., Price, A. L., & Singh, L. (2009). Reconstructing Indian population history. *Nature*, 461(7263), 489-494.
5. DePristo, M. A. (2010). The \$1,000 genome: The revolution in DNA sequencing and the new era of personalized medicine. *The American Journal of Human Genetics*, 87(6), 742.
6. Jaworski, E., Routh, A., Head, S. R., Ordoukhanian, P., & Salomon, D. R. (2018). Next Generation Sequencing: Methods and Protocols. Springer New York.
7. Indian Council of Medical Research. (2017). National ethical guidelines for biomedical and health research involving human participants. National Ethics Guidelines for Biomedical and Health Research involving Human Participants.
8. Kumar, M., Sandhu, H., & Roshan, R. (2020). Indian Council of Medical Research's International Collaboration & Partnerships; Health Ministry's Screening Committee: Facts, figures & procedures. *The Indian Journal of Medical Research*, 151(6), 550.

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