SKILL ENHANCEMENT COURSES

SYLLABUS FOR THE

SUBJECT: HUMAN GENETICS

for the award of the Degree in

BACHELOR OF ARTS/ BACHELOR OF SCIENCE

(Offered under 3-year UG Degree Programme)

(Credit Based Grading System)
under NEP 2020

Batch: 2025–28

GURU NANAK DEV UNIVERSITY AMRITSAR

SCHEME

SKILL ENHANCEMENT COURSE

HUMAN GENETICS

SEC-I

Sr. No.	Course Code	Course Title	Credits L-T-P	Marks
1.		BASICS OF HUMAN GENETICS (THEORY)	2-0-0	50
2.		BASIC OF HUMAN GENETICS (PRACTICAL)	0-0-1	25

HUMAN GENETICS

SKILL ENHANCEMENT COURSE

(SEC-I)

BASICS OF HUMAN GENETICS

(THEORY)

Time : 3 Hours **L-T-P**

Credits: 2-0-0

Marks : 50

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

SECTION-A

Introduction to Genetics, Mitosis and Meiosis, The Human Genome structure and organization, Mitochondrial genome, Human chromosomes— types and analysis, Variation in number and arrangement, Sex determination and Sex chromosomes

SECTION-B

Mendelian Genetics, Patterns of inheritance: Autosomal dominant, Autosomal recessive, X-linked dominant, X-linked recessive, Y-linked, Multifactorial inheritance

SECTION-C

Gene mutation and single gene disorders, DNA repair, Overview of population genetics, Hardy-Weinberg principle,

SECTION-D

Applications of genetic testing: overview of cytogenetic and molecular testing, prenatal diagnosis, amniocentesis, Chorionic villus sampling (CVS), genetic counselling, gene therapy, genetic testing, human Genome Project.

Books Recommended

1. Cummings, M.R. (2009), Human Heredity: Principles and Issues. Pacific Grove, CA: Brooks/Cole.
2. Cummings, M.R. (2009), Human Genetics. Cengage Learning India Pvt. Ltd., New Delhi.
3. Gardner, A. and Davies, T. (2009). Human Genetics. Scion Publishing, 2nd ed.
4. Lewis, R. (2011). Human Genetics: The Basics. Routledge, Oxon.
5. Sanders, M.F. and Bowman, J.L. (2012), Genetics — An Integrated Approach. Pearson, Boston.

HUMAN GENETICS

SKILL ENHANCEMENT COURSE

(SEC-I)

BASICS OF HUMAN GENETICS

(PRACTICAL)

L-T-P
Credits: 0-0-1
Marks : 25

PRACTICAL :

Study of cell structure, Practice on mitotic and meiotic cell division. Experiments on probability and Chi-square test. Experiments on monohybrid, dihybrid, trihybrid, test cross and back cross, Dermatoglyphics