

**Curriculum Development for Faculty of Humanities and Social Sciences**

**Name of Institute:** Symbiosis School of Liberal Arts

**Course Name: Elective:** Introduction to Human Genetics

**(UG/PG):** UG

**Number of Credits:** 4 (60 hrs)

**Level:** 1

**Introduction**

This course in Genetics (minor) attempts to address some of the basic and fundamental issues related to field of genetics. It further narrows the focus of genetics to deal with concepts in Human Genetics covering areas from basics like DNA, inheritance and the occurrence of mutations, mechanisms that lead to uniqueness in humans, to understanding the prevalence of genetic disease in humans, that modes of passing through generations and our understanding of how they need to be tackled on the social and psychological front through Genetic Counseling. The course also includes a short understanding of where the subject of genetics is applied in our everyday lives and how it will affect the way we look at our lifestyles in the future.

**Learning Objective(s):**

* This is an introductory course and defines human genetics and its relationship to other sciences.
* This course is intended to give an overview of the field of genetics which will help students inclined toward doing a major in Biology/Life Sciences/Psychology
* The course examines the overarching theories governing human genetics and its importance and interaction in applied sciences and genetic counseling.
* The course is conceptually oriented and needs to be taught with an emphasis on information and build in the logical structure of biology.

**At the end of the course the students are expected to :**

* Understand the basics of human genetics
* To understand the interlinking between human genetics and alternate disciplines
* To understand the impact and assessment of applied genetics in daily life.

**Pedagogy:**

* Follows an instructive and informative methodology of instruction.
* Interactive class discussions on every concept. Small class size.
* Practical understanding regarding the various core and interdisciplinary concepts using articles, news clippings etc.
* Lab Component : through demonstrations and possible practical sessions.

**Pre-requisites:**

The course does not assume any background of biology at the +2 level

**Course Content:**

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| S.No. | Topic | Hours |
| 1 | **Fundamentals of Biology**:* Biology in the broader picture of science.
* The sub-disciplines of Biology
* A brief history of biological thought.
* Contributions of biology to human history.
 | 8 |
| 2 | **Basic Human Genetics :** * Concept of Inheritance, Genetics and Nucleic Acids as carriers of Information
* Genetics Inheritance patterns in haploid and diploid organisms, Mendelian Genetics
* Chromosomes, Genes and the messages of inheritance
* Basic Population Genetics
 | 10 |
| 3 | **Genetics and Evolution:** * Role of genes in evolution – Gene Flow, Differentiation & Inbreeding
* Why am I like Dad ? Why am I not like my bro?
* Mutations and their significance
* Positive and Negative mutations
* Genetics and Environment - Natural Selection & Genetic Drift
 | 10 |
| 4 | **Human Genetics and Disease:** * Concept of disease liked to inheritance
* Chromosomal disorders
* Genetic Disorders - metabolic, epigenetic, multifactorial
* Genes, disease and social behavior
 | 10 |
| 6 | **Genetic Counseling:** * Principles and Practices in genetic Counseling
* What is Medical Genetics
* Methods and Skills
* Psychosocial Issues in Genetic Counseling
* Cancer Genetic Counseling
* Ethical and Professional Issues in Genetic Counseling
 | 12 |
| 7 | **Applied Human Genetics:**  * Prenatal Diagnostics
* Personalized Genomics
* Cancer Genetics
* Stem Cells and Regenerative Medicine
 | 10 |

**Books Recommended :**

* Genome : Matt Ridley
* The Selfish Gene : Richard Dawkins
* Why Evolution is True : Jerry Coyne ( 2009)
* Evolutionary Analysis : Scott Freeman & Joh Herror ( 2013)
* The Beak of the Finch : Jonathan Weiner

**Suggested Evaluation Methods:**

As per SIU Rules on Pg no. 20 – 5.1 e) III.

**Parallel/Similar courses in the existing curriculum:**

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| S.No. | Name of the course | Institute where it was offered |
|  | NA |  |

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| Name of Member |  |  |  |  |  |
| Designation |  |  |  |  |  |
| Org. / Inst. |  |  |  |  |  |
| Signature |  |  |  |  |  |

Name of the Expert:

Signature:

Date